FLIGHT

MAGAZINE

SEPTEMBER 1959
50 cents

6 SEP 18 1959
Cont. Copy

CESSNA 210 WITH GEAR RETRACTED

See page 28

get airline "nav-com" performance in your BEECHCRAFT TRAVEL AIR

... with the installation of reliable, lightweight, compact **wilcox** CANARI Equipment

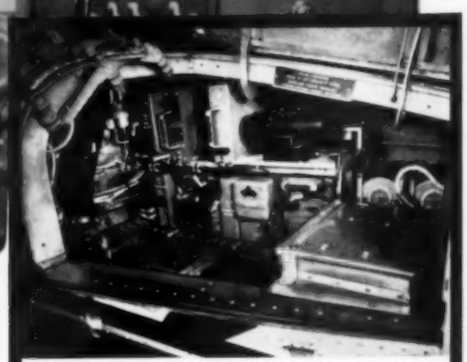
This newest, light Beachcraft twin can be equipped with a full complement of advanced, airline communications and navigation equipment.

Wilcox, who pioneered the design and development of this equipment, has made it light in weight, small in size, moderate in cost . . . yet so rugged and dependable it meets airline performance standards. It is the same equipment used by many of the world's leading airlines.

TSO'd Wilcox CANARI equipment is particularly suited for operation by a single pilot in high traffic density areas or when flying under IFR conditions.

In addition to the Beechcraft Travel Air, Wilcox CANARI equipment is available for installation in all types of business aircraft. For more detailed information about an installation for your plane, see your Wilcox Dealer, or write direct to

wilcox
Electric Company, Inc.
Fourteenth & Chestnut Kansas City 27, Mo., U. S. A.



Nose Installation of wilcox CANARI Equipment in the Beechcraft Travel Air contains:

MODEL 705
Communications Receiver

MODEL 740
Compass Amplifier

MODEL 703
Mag Cat

MODEL 707
VHF Transmitter

MODEL 702
Marker Receiver

MODEL 700
Glideslope Receiver

MODEL 706
VHF Navigation Receiver

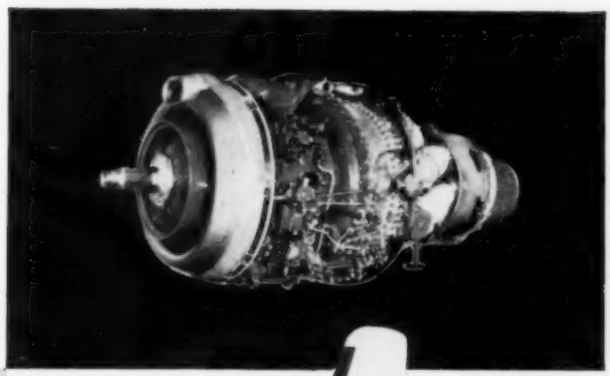
MODEL 701
ADF Receiver

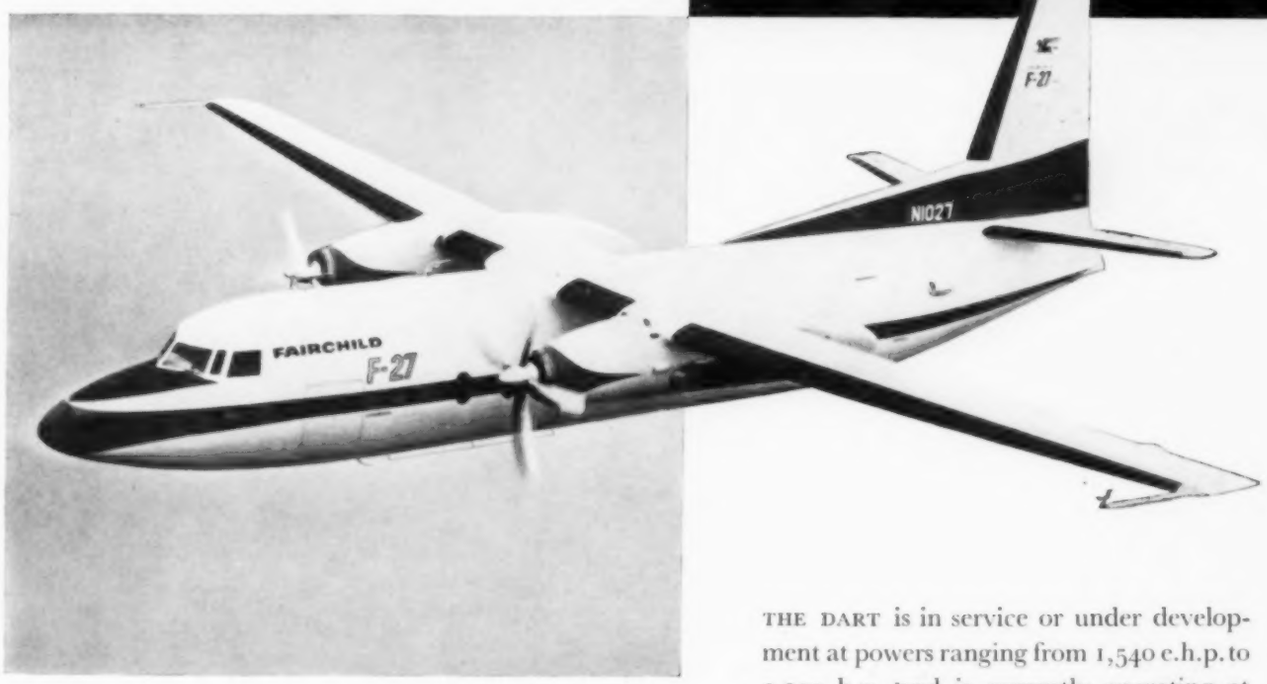
MODEL 715
Power Supplies (2)

THE FAIRCHILD F-27

IS POWERED BY

ROLLS-ROYCE
DART PROP-JETS





THE DART is in service or under development at powers ranging from 1,540 e.h.p. to 3,200 h.p. and is currently operating at overhaul lives of up to 2,400 hours. It has an unexcelled record of reliability and has flown many millions of hours in scheduled service on the air routes of six continents with total flying hours increasing by well over 250,000 hours per month.

ROLLS-ROYCE LIMITED, DERBY, ENGLAND

AERO ENGINES • MOTOR CARS • DIESEL AND GASOLINE ENGINES • ROCKET MOTORS • NUCLEAR PROPULSION

United Introduces DC-8 Jet Service

United Air Lines will be among the first to inaugurate scheduled transcontinental DC-8 jet service. The new Douglas DC-8's in United's fleet will accommodate 113 passengers with a mail and cargo capacity of 12,000 pounds. Cruising speed is 575-600 m.p.h. To date, United has 40 DC-8's on order.

Pratt & Whitney JT-3's (13,000 pounds thrust) will power 22 of the 40 DC-8's ordered. The remaining 18 will be equipped with the more powerful JT-4 (15,900 pounds thrust). The JT-3 (or J-57 as the military version is called) is the western world's primary jet-turbine engine. Since full-scale production in 1953, more than 14,500 of these engines have logged nearly 3 million hours. A first cousin of the proven JT-3, the more powerful JT-4 (J-75) has an established performance record on advanced Air Force fighters.

There are some interesting statistics on United's DC-8's. For example, each plane can account for upwards of 71,000 passenger miles per hour. Douglas engineers, technicians and flight crews ran up more than 3 million man-hours in testing the DC-8. During the air line certification tests on the JT-3 and JT-4, engine performance withstood rigorous tests far above operating requirements.

Jet age lounge of United's DC-8 jet Mainliner has generous dimensions and smart decor. Cabin pressure is maintained at sea level up to 23,000 feet; at 40,000 feet, pressure compares to 6,700 feet.

Phillips Petroleum Company, a supplier of aviation gasoline and jet fuel for United, salutes this important jet age achievement.

● A pioneer in the development of aviation fuels, Phillips Petroleum Company is a leading supplier of high octane gasoline, super-performance jet fuels, and aircraft lubricating oils for commercial, private, and military aircraft. And Phillips research continues to lead the way, developing new fuels and lubricants for the aircraft of tomorrow.

AVIATION DIVISION • PHILLIPS PETROLEUM COMPANY • BARTLESVILLE, OKLAHOMA

AIR Report

Significant Trends and News

LOOK FOR NARCO TO ANNOUNCE NEW MARK VI, compact, 6.5-lb., $950, 190-channel, crystal-controlled omni-ILS-communications receiver with same panel dimensions as ponular Mark V and containing omni-ILS indicator. . . . Narco has a $273,000 FAA contract to develop and deliver by September, 1960, 20 low-cost DME (distance measuring equipment) units suitable for personal and business-type lightplanes.

HOTTEST ITEM AMONG FORTHCOMING 1960 LIGHTPLANES will be new low-cost Model 33 version of the Beech Bonanza, priced in the $20,000 bracket well below the Bonanza. Basically a Bonanza, it will feature conventional 3-surface tail with sweptback vertical fin. Engine will be rated at less power than that of the Bonanza.

TRANSISTORIZED MITCHELL AUTOPILOT is now available in a 2-control economy model priced at $1,095 and is FAA-approved for most 4-place single-engine lightplanes. It is also available with the new Mitchell automatic heading selector for $1,480.

MANUFACTURE OF THE UMBAUGH MODEL 18 AUTOGIRO LIGHTPLANE has been subcontracted to Fairchild Engine and Airplane Corp., Hagerstown, Maryland, according to Raymond E. Umbaugh, president of Umbaugh Aircraft Corp., Ocala, Fla. This apparently replaces manufacturing contract once held by Colonial Aircraft at Sanford, Maine. Umbaugh Model 18 seats 2, is powered by 180-hp. Lycoming engine driving pusher propeller and utilizes 3-blade rotary wing for lift. Rotor is pre-rotated briefly for take-off by the engine through a clutch that is disconnected before leaving the ground, after which the unpowered rotor windmills from forward motion provided by pusher propeller. Umbaugh hopes to deliver the autogiro in large numbers at $9,995 when production gets under way early in 1960 after certification.

ANYBODY HAVE A 1928 MODEL "B" ARC RADIO RANGE RECEIVER? Aircraft Radio Corporation, Boonton, N. J., says it will make a suitable reward to person offering it the first acceptable Model B, which will be donated to Smithsonian Institution to portray ARC part in aviation progress. The Model B was used by NAT, forerunner of United Air Lines, and Admiral Byrd used one of the sets on his first South Pole expedition in 1929.

NEW VERTIFAN VTOL AIRCRAFT will be studied under a USAF preliminary aircraft design study contract awarded to Ryan Aeronautical Co., with General Electric working with Ryan. Vertifan concept features one or more fans horizontally submerged in a wing and powered by a tip turbine driven by jet engine exhaust. Fan operation provides vertical take-off or landing lift but power from jet engine is diverted straight rearward from the fans for forward thrust. This system can be applied for use in conventional jet aircraft. Shutter-like vanes direct airflow from the fans and seal them off inside the wing in forward flight.

OPTIONAL JUNIOR JATO STANDBY ROCKET POWER FOR BEECH TWIN-BONANZA has been approved by FAA and is now offered by Beech Aircraft on new airplanes and by distributor-dealers in kits for existing Twin-Bonanzas. Mounted atop each nacelle fairing, each Junior Jato rocket weighs 42 lbs. and offers 250 lbs. of thrust (100 hp. at climb speed) for 15-sec. duration.

CANADIAN PRODUCTION OF 200 LOCKHEED F-104G FIGHTERS

(Continued on page 66)

FLIGHT MAGAZINE

SEPTEMBER, 1959 VOL. 48, No. 9

THIS MONTH'S COVER shows the new 4-place Cessna Model 210, first high-wing lightplane with retractable tricycle landing gear. To see how unique gear retracts, look at pages 28-29. Model 210 is powered by fuel-injection 260-hp. Continental engine, has new conical camber wingtips for more stability and less drag. —(Cessna Photo.)

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Just Among Ourselves—EDITORIAL: CORRECTIVE MEASURES . . 17

New Cessna Model 210—BY GEORGE E. HADDAWAY—COMPLETE DETAILS AND PHOTOGRAPHS DESCRIBE HIGH-WING WITH RETRACTABLE GEAR 28

Wyoming Mecca for Airmen—JACKSON HOLE AIRPORT OPENS SCENIC WILDERNESS AREA TO FLYING VACATIONERS 33

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GEORGE E. HADDAWAY, Editor-Publisher; TOM ASHLEY, Managing Editor; FRED N. STONES, JR., Business Manager; LOUISE ROBERTSON, Circulation; E. H. PICKERING, Consultant; P. O. Box 750 (2700 N. Haskell Ave.), Dallas, Texas — Telephone TAylor 3-6191.

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Lockheed JetStar – world's fastest corporate plane –

4-Engine performance and reliability

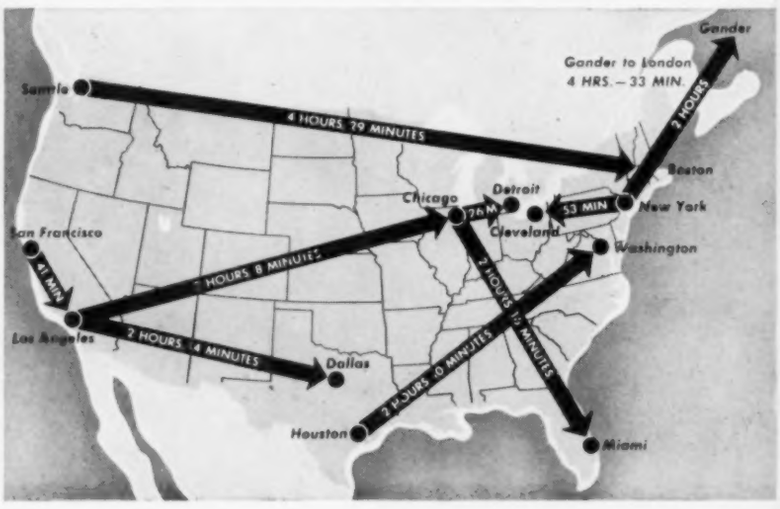
The magnificent new JetStar provides traveling executives with all the speed, safety, and reliability of a large jet airliner – plus the added convenience of being able to land in hundreds of cities with airport runways shorter than 5,000 feet.

Powered by four aft-mounted Pratt & Whitney JT-12 jet engines – each developing 3,000 pounds of thrust – the JetStar is the quietest, safest, fastest corporate plane now flying. A full 200 miles per hour faster than piston-engine and turbo-prop planes, the JetStar has power to spare. With a full payload, it can fly and *climb* on only *two* engines.

If you would like a JetStar Route Survey made of your air transportation requirements – without cost to you – please write: JetStar Commercial Sales, Lockheed Georgia Division, Marietta, Ga.

Fully pressurized and air-conditioned, the JetStar's spacious cabin is amazingly quiet and vibration-free in flight—permitting you to work as efficiently as in your own office.

On-time arrivals are routine in a Lockheed JetStar—because it flies at altitudes up to 45,000 feet, above bad weather that all too frequently grounds other types of corporate aircraft.



LOCKHEED

JET TRANSPORTS • JET FIGHTERS • JET TRAINERS • COMMERCIAL & MILITARY PROP-JET TRANSPORTS • ROCKETRY
BALLISTIC MISSILE RESEARCH & DEVELOPMENT • WEAPON SYSTEM MANAGEMENT • ANTI-SUBMARINE PATROL AIRCRAFT
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NUCLEAR REACTOR DESIGN & DEVELOPMENT • GROUND SUPPORT EQUIPMENT • WORLD-WIDE AIRCRAFT MAINTENANCE

NEW FROM COLLINS

AIRLINE QUALITY AUTOMATIC FLIGHT CONTROL FOR LIGHT AND MEDIUM TWINS

Advanced performance automatic flight control and instrumentation, never before available in lightweight systems for twin engine aircraft, are now offered in Collins new AP-102 Automatic Pilot and FD-107 Integrated Flight System.

The AP-102/FD-107 are combined to provide complete, transient free automatic control and monitoring of all modes of automatic flight. Flight director steering, integrated "flight picture" navigation and primary attitude instrumentation are also provided for manual control of aircraft in a combination system weighing 89.6 pounds.

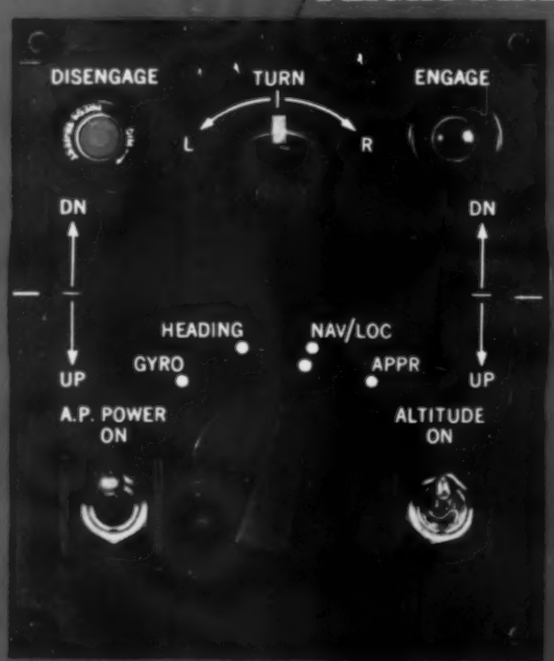
The AP-102 enables automatic control of all standard flight maneuvers; acquisition and holding of selected headings; glideslope and localizer course following during final approach with automatic crosswind correction; automatic trim and control of pitch attitude, and automatic level off and hold of selected altitudes.

Replacing at least four single purpose instruments on conventional instrument panels, the two integrated instruments of the FD-107 provide primary attitude and navigational situation information during either automatic or manual flight. A steering pointer monitors the automatic pilot during automatic flight and presents computed flight director steering during manual flight. The FD-107 utilized without the Automatic Pilot, weighs only 22.5 pounds.

COLLINS

AP-102 FD-107

LIGHTWEIGHT AUTOMATIC PILOT AND FLIGHT DIRECTOR



COLLINS

COLLINS RADIO COMPANY • CEDAR RAPIDS, IOWA • DALLAS, TEXAS • BURBANK, CALIFORNIA

Esso was ready with fuels for the jet age

Esso has pioneered in aviation ever since there *was* aviation!

- Esso fueled the Wright Brothers' first flight.
- Esso developed the first 100 octane aviation gasoline.
- Esso had jet fuels and lubricants ready *before the commercial planes that use them were built.*

Today, Esso and affiliated companies are proud to be a major supplier of jet fuels and jet engine oils to leading airlines throughout the world. High quality aviation products are also available to private pilots through dependable Esso Aviation Dealers.

ESSO SUPPLIES FUELS TO THESE WORLD-FAMOUS AIRLINES:

Air France
Airwork, Ltd.
Alitalia
Allegheny Airlines
American Airlines
Avensa, (Aerovias Venezolanas, S.A.)
AVIANCA (Aerovias Nacionales de Colombia, S.A.)
BEA (British European Airways Corporation)
Braniff International Airways
Capital Airlines
Capitol Airways
CPAL (Canadian Pacific Air Lines)
Cruzeiro (Servicos Aereos do Sul, Ltda.)
Cubana Airlines
Delta Air Lines
Eagle Airways (Bermuda) Ltd.
Eastern Air Lines
Iberia Air Lines
Japan Air Lines
KLM (Royal Dutch Airlines)
LAN (Linea Aerea Nacional)
LAV (Linea Aeropostal Venezolana)
Lufthansa German Airlines
Mohawk Airlines
National Airlines
Northwest Orient Airlines
PAA (Pan American World Airways) Panagra
Panair do Brasil, S.A.
Piedmont Airlines
Real Aerovias Nacional
Riddle Airlines
SABENA Belgian Airlines
SAS (Scandinavian Airlines System)
Seaboard & Western Airlines
Southeast Airlines
Southern Airways
Swissair
TACA International Airlines S.A.
TCA (Trans-Canada Air Lines)
Transocean Airlines
TWA (Trans World Airlines)
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Highways or Skyways..."ESSO RESEARCH works wonders with oil"

WHY DOES THE BOSS USE A BELL?

Answer: no executive fleet is complete without one.

For today, the short haul can be the longest by far, when executive time — and tempers — get lost on the ground. A Bell helicopter makes the trip — from office to airport, to plant or job site — a simple thing. Banishes old worries about landing areas, traffic and fixed-wing weather. The Bell does a dozen different jobs a day — yet *always pays its own way!*

Are you missing a bet for your boss by not taking a *close* look at the Bell? Especially the new 4-place Bell Ranger. Just to see this little beauty makes you want to fly it, to sample its greater range (up to 40% over previous models), to test its speed and maneuverability — altogether, twenty-five separate engineering advancements in this '59 Bell. Yet, it operates at lower cost, can be maintained with greater ease than any other helicopter in its class. Why not let us give you the full story on the Bell in the business hangar — show you how easily your pilots can earn the helicopter rating — how economically your company can own or charter a Bell. Address Department 212-I, Bell Helicopter Corporation, Fort Worth, Texas.

See you at the
NBAA CONVENTION
Minneapolis - Oct. 6-7-8

BELL HELICOPTER CORP.

FORT WORTH, TEXAS • SUBSIDIARY OF BELL AIRCRAFT CORPORATION

AC Sparks All Five Winners
in 1959 Powder Puff Derby

FIRST
Pilot: Aileen Saunders
Co-pilot: Jerelyn Cassel
Plane: Cessna 172

SECOND
Pilot: Juanita Newell
Co-pilot: Jimmye Lou Shelton
Plane: Piper Comanche P-24

THIRD
Pilot: Margo Callaway
Co-pilot: Sandra Callaway
Plane: Cessna 140

FOURTH
Pilot: Marian Burke
Co-pilot: Evelyn Kelly
Plane: Piper PA-18

FIFTH
Pilot: Pauline Glasson
Co-pilot: Ardath McCreery
Plane: Cessna 175

Lifting their planes off the runway at Lawrence, Massachusetts, the lovely and skillful ladies flew a rugged 2,470 miles westward to touch down at Seattle, Washington. Once again this great competition displayed the ability of the participants to get the most out of their planes.

Of the more than 60 planes that started the race, the first five winners were sparked by AC . . . In fact, ACs were used on 16 out of the first 20 planes.

That says a lot for the performance and reliability of AC Aircraft Spark Plugs. What's more, this is the fourth successive year that ACs have sparked the winning plane.

AC Aircraft Spark Plugs have proved their high quality in millions of hours of flight in private, military and commercial planes. You'll find ACs best for the plane you fly. Get them today from your AC supplier.

Aircraft Care starts with

AC

AIRCRAFT SPARK PLUGS

AC SPARK PLUG ⚛ THE ELECTRONICS DIVISION OF GENERAL MOTORS

DISTRIBUTED BY:
Airwork Corporation • General Aircraft Supply Corporation
Pacific Airmotive Corporation • Southwest Airmotive Company
Standard Aero Engine Ltd. • Van Dusen Aircraft Supplies, Inc.

for your transport fleet...

A SUPER CONVAIR

with proven

ALLISON

PROP-JET POWER

The Convair with its many million hours of dependable airline service becomes the *Super* Convair when it is powered by the proven General Motors power package of Allison Prop-Jet engines and Aeroproducts propellers.

This is the power team now accumulating nearly 100,000 hours of flight experience each month in the Lockheed Electra and C-130 Hercules . . . with the rate increasing rapidly as new aircraft go into service. It will already have 1,500,000 hours of military and commercial flight time when the first Super Convair is ready for delivery late this year.

Whether it is used in trunk or local airline service—or as a corporate aircraft—the Allison Super Convair provides experienced dependability. And this is in addition to performance capabilities which will carry you faster, farther, higher and with greater comfort than the aircraft you are now using.

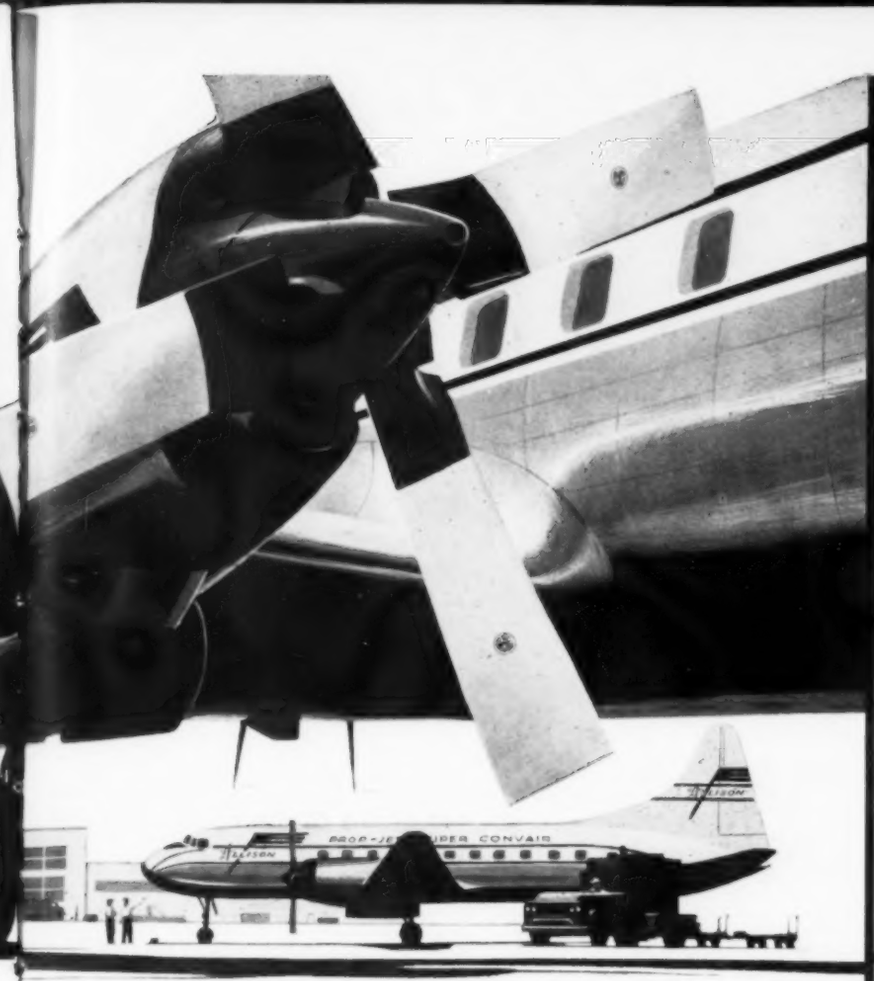
With Allison Prop-Jet power in your Super Convair you will have other advantages. A spare parts and overhaul program is in operation. This includes a Unit Exchange plan which means you can greatly reduce your inventory requirement for spare engines, propellers and spare parts. It's the same plan already used by a number of the 15 airlines now or soon to be operating the Allison-powered Electra in world-wide service.

All this applies whether you are concerned with airline management or own and use aircraft as a necessary part of your own business. But to be more specific—

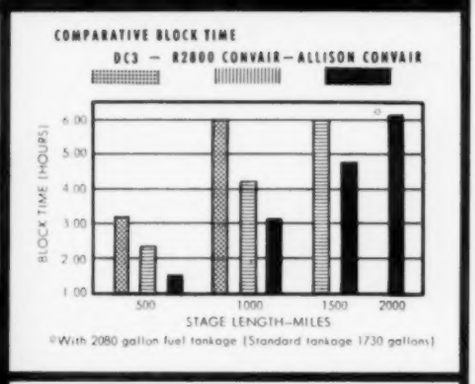
FOR THE CORPORATE AIRCRAFT OPERATOR...

With an Allison Prop-Jet Super Convair, you will have an abundance of dependable power for quick, short field take-offs and rapid climb above the weather where the air is smoother. You'll fly in pressurized comfort and you won't experience the noisy pounding vibration which marks piston engine aircraft. And most importantly you will save time – giving you more hours in the day, adding up to more days in the year to do your work or relax. You also gain time by having ample room and comfortable surroundings to do more work or reading en route. You can select the interior configuration which best suits your taste and convenience.

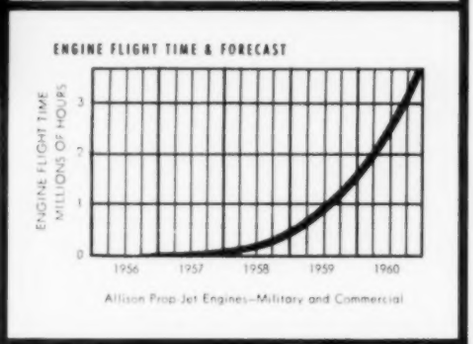
ALLISON PROP-JET P



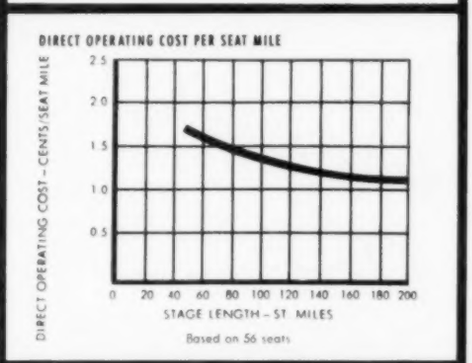
CHECK THE CHARTS... there's profit in Allison Prop-Jet Super Convairs



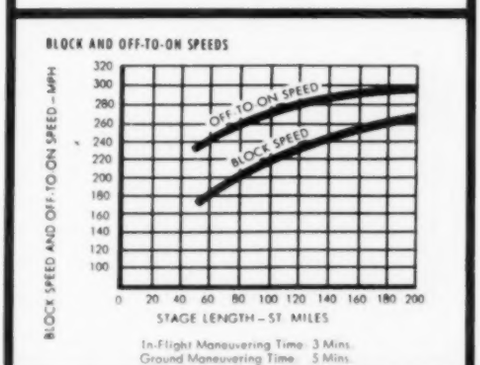
*With 2080 gallon fuel tankage (Standard tankage 1730 gallons)



Allison Prop-Jet Engines—Military and Commercial



Based on 56 seats



In-Flight Maneuvering Time: 3 Mins.
Ground Maneuvering Time: 5 Mins.

FOR AIRLINE MANAGEMENT...

The Allison Prop-Jet Super Convair can far outearn comparable aircraft—old or new.

There's seating capacity for up to 58 passengers—speed and comfort to attract more and more revenue—ability to cover present routes with fewer planes or more routes with the same number of planes you operate now.

And Allison's unique Unit Exchange plan for engines and propellers greatly reduces your inventory requirements. Spare engines, propellers and spare components can be shipped on demand from our docks direct to you. When we take care of the overhaul, your only parts inventory requirement is for line maintenance.

FOR ANY AIRCRAFT OPERATOR...

Check the charts which are of greatest interest to you. Then get *all* the facts on the Allison Prop-Jet Super Convair, particularly the details on our entire engine and propeller support program, including the Unit Exchange plan. Write on your letterhead to:

Mr. William O. Watson
Manager, Sales & Contracts Dept. 1-B
Aircraft Engines Operations
Allison Division
General Motors Corporation
Indianapolis 6, Indiana

POWER

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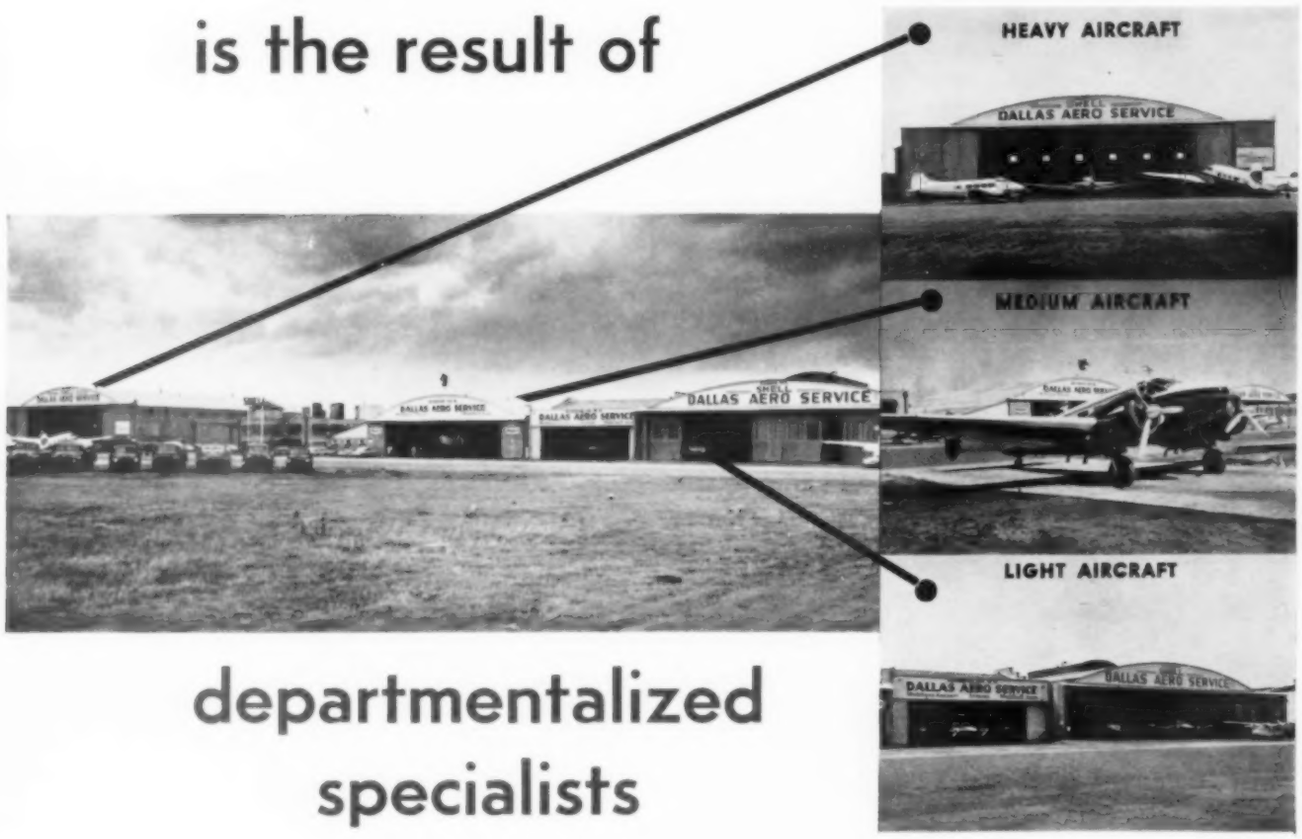
AEROPRODUCTS PROPELLERS
JET POWER

DAS superior maintenance work on heavy, medium and light aircraft is the result of



departmentalized specialists

- Maintenance
- Overhaul
- Engineering
- Modification
- Electronics
- Hydraulics

Possibly no one piece of machinery is as complex as a modern airplane. Likewise, no two airplanes are alike. That is why DALLAS AERO SERVICE follows a policy of departmentalizing maintenance of aircraft in different weight categories. Our aircraft maintenance division is divided into three separate departments for heavy, medium and light aircraft. The crews in each of these departments are rated specialists for each aircraft classification. These technicians are familiar with all bulletins and factory recommended procedures. Their work is speeded by the use of special tools and equipment for the various kinds of aircraft. This DAS specialization plus factory new parts and accessories means a superior job in minimum time.

Corporate, business and private aircraft owners by greater and greater numbers are relying on DAS for departmentalized maintenance and the perfectionism that stems from our specialization. This Dallas Aero Service operational policy has saved our customers thousands of dollars and extensive time delays.

May we make a suggestion? Next time you have a service or maintenance problem let the people who know your airplane best — **the specialists of DAS** — solve your problem.

DALLAS AERO SERVICE

W. F. LONG, President

3300 LOVE FIELD DRIVE • PHONE FL 2-2641 • DALLAS 35, TEXAS

COMPLETE ONE-STOP SERVICE ON CONVENIENT LOVE FIELD

RAZOR-SHARP SELECTIVITY...

CONTROL UNIT FOR TYPE 210

...IS ONLY ONE HIGH PERFORMANCE FEATURE OF ARC's 360 CHANNEL TRANSMITTER-RECEIVER TYPE 210

CERTIFIED TO FAA'S TSO C-37 AND C-38 CATEGORY A

Clear, positive channel tuning without adjacent channel interference is only one of many features that distinguish this quality-built instrument. Full 360-channel transmission and reception is another. No need to add more later. 15 watts of power mean optimum distance range when needed.

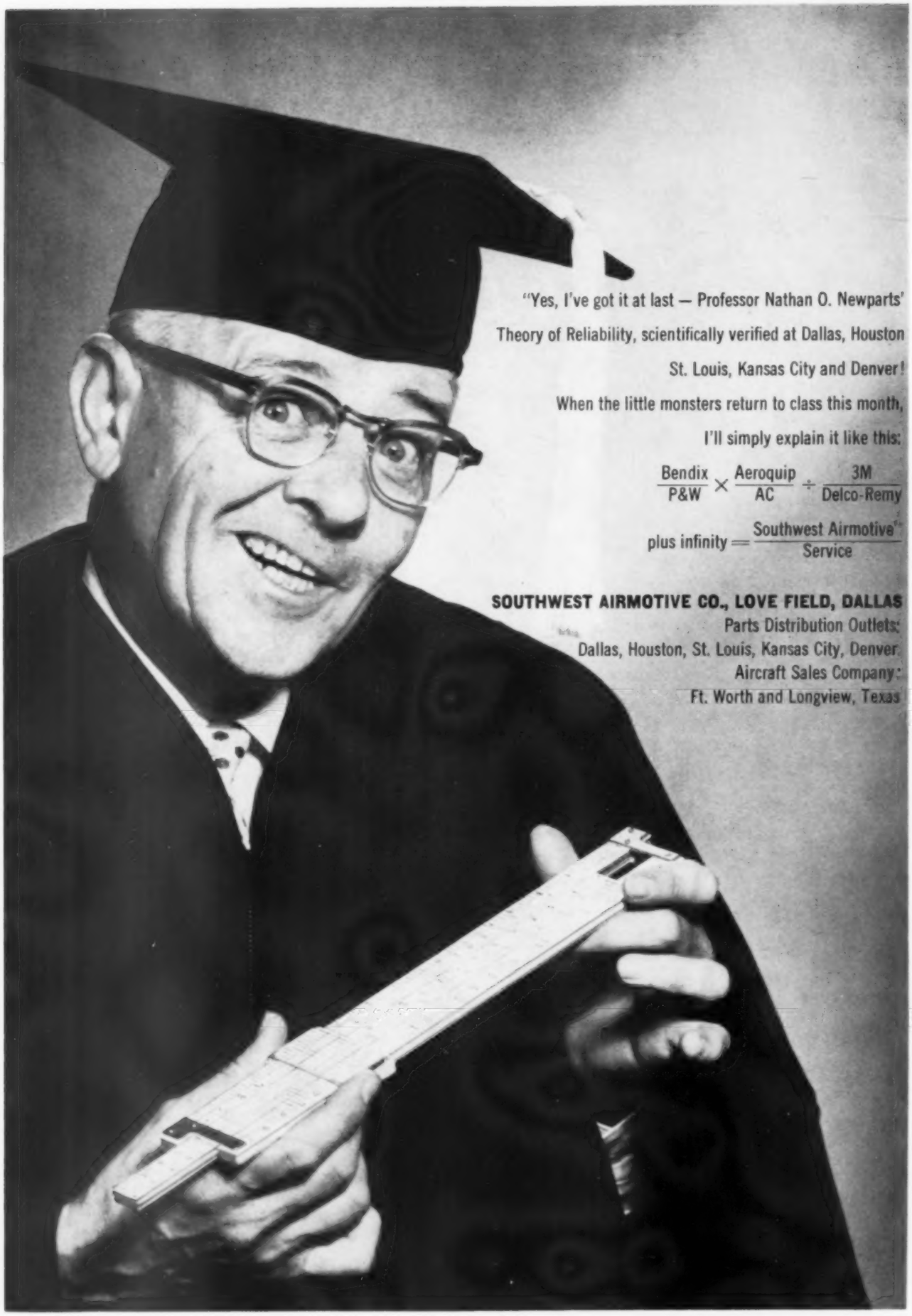
As in all ARC equipment, there is an extra margin of stability and tested-and-proved reliability. Not just while the Type 210 is new will it deliver peak performance. It will remain dependable in every function after years of continuous service — and under extreme operational and environmental conditions. This is the extra margin of quality that makes ARC equipment out-perform and out-last others. Ask your ARC dealer.

Aircraft Radio Corporation

BOONTON, NEW JERSEY

Dependable Airborne Electronic Equipment Since 1928

OMNI LOC RECEIVERS • COURSE DIRECTORS • AUTOMATIC DIRECTION FINDERS • 360 CHANNEL VHF TRANSMITTER-RECEIVERS • GLIDE SLOPE RECEIVERS OMNIRANGE SIGNAL GENERATORS AND STANDARD COURSE CHECKERS • 900-2100 MC SIGNAL GENERATORS • 10-CHANNEL ISOLATION AMPLIFIERS UHF AND VHF RECEIVERS AND TRANSMITTERS (5 to 360 CHANNELS) • MARKER BEACON RECEIVERS • INTERPHONE AMPLIFIERS • CABIN AUDIO AMPLIFIERS


"Yes, I've got it at last — Professor Nathan O. Newparts'
Theory of Reliability, scientifically verified at Dallas, Houston
St. Louis, Kansas City and Denver!
When the little monsters return to class this month,
I'll simply explain it like this:
Bendix / P&W × Aeroquip / AC ÷ 3M / Delco-Remy
plus infinity = Southwest Airmotive / Service
SOUTHWEST AIRMOTIVE CO., LOVE FIELD, DALLAS
Parts Distribution Outlets:
Dallas, Houston, St. Louis, Kansas City, Denver
Aircraft Sales Company:
Ft. Worth and Longview, Texas

Just among ourselves

Corrective Measures

NO one with any considerable experience in the field of general aviation is very proud of our statistical files on accidents, which, over the past ten years, show that one out of approximately every 25 airplanes is involved in an accident and ten per cent of all the accidents each year have been fatal.

In a recent speech to the Flying Farmers, CAB Air Safety Investigator Russ Abbott pointed out that more than 50 per cent of all general aviation accidents have occurred in pleasure flying, accounting for eight times as many accidents as all business flying, three times as many as commercial and industrial flying and two times as many as instructional flying.

Since weather is a primary or related factor in thirty per cent of all light plane accidents, Mr. Abbott strongly urges that five hours of elementary instrument flying experience be mandatory in the training requirements for a private pilot certificate. Until such time as it becomes mandatory (FAA and not CAB is now the ruling body since passage of the Federal Aviation Act last year) he suggests that presently-certificated pilots voluntarily acquire at least this minimum of training.

"Over a period of years," he pointed out, "literally thousands of safety bulletins have been published by the CAB, the CAA, the FAA, the various state aeronautics departments, the Flight Safety Foundation and others, admonishing the pilots not to fly in marginal weather unless both the aircraft and the pilot were qualified for instrument flight. In view of the fact that these warnings have been so often disregarded, we are faced with the inevitable conclusion that the 'why' of weather accidents, as irrational and unintelligent as it appears to be, for the most part, is a product of human compulsion — the urge to complete a flight to the chosen destination despite a recognized hazard."

At this writing there appears to be a general "crack down" on pilots by the Federal Aviation Administration, a sort of wholesale filing of violations. Reports are pouring in that FAA is getting tough in the matter of airworthiness requirements as well as in the flight rules department. Whether this campaign is inspired by the aviation safety people or the lawyers within FAA, it's hard to say. But it does follow an old familiar pattern, as the pendulum never stands still but swings from one extreme to the other. Oldtimers will say philosophically, "We've been through all this before."

There's no evidence that tough regulations and law suits prevent accidents. If one administration cracks down and files violations on a wholesale basis and another comes along and relaxes the pressure, the accident statistics remain practically constant. We have adhered to the school of thought that a revision of primary flight training procedures and indoctrination, coupled with an effective educational program, would do more than all the policing and regulations the Washington lawyers could concoct. While it is true much has been written on the subject of flying safety, there has never been a really effective, long range, scientifically planned, total aviation safety program for certificated pilots, despite the millions of printed and spoken words on the subject. The FAA and the CAB have all the data and statistics in their files but they never have devised a realistic method of translating the facts into a thorough and penetrating educational program. Some private organizations have nibbled around on the problem but these campaigns usually were one-shot affairs or too superficial for sustained usage. Safety seminars are good but generally reach only those pilots who are already safety conscious. Published material of considerable value goes un-read by the people who need it the most.

So we have the unique situation of knowing the causes of our accidents in general aviation but we are unable to come up with adequate corrective measures. These accidents run to a definite pattern. We know there will be more than 4,000 general aviation accidents this year that will take some 800 lives. After fairly thorough investigations the experts will catalogue the causes, and the percentages will be just about the same as for past years. So far this year (January through July) there have been 235 fatal general aviation accidents (aircraft below 12,500 pounds gross). Twenty-five per cent of these involved weather in which there were 113 casualties. You can predict within a very narrow margin of error what the score board will show when 1959's record is in.

Perhaps we have become as calloused about our aviation accidents as the motorists have become about the slaughter on the highways. If the industry and the Federal Aviation Agency can agree on mandatory instrument training for all private certificates, then let's get on with the requirement, even though it isn't the total answer.

In our opinion, first priority should be given an all-out educational program and an upgrading of our primary flight training standards. This would be striking at the roots of all the causes of accidents — not just the weather bugaboo, which admittedly is the biggest one. While the FAA can never avoid its "policing" functions, doesn't it make good sense that civil aviation is more apt to prosper and develop firmly in an atmosphere of government-industry partnership rather than in an atmosphere of hostility bred from an attitude that the only corrective measure in the matter of general aviation safety is to file violations right and left in a wholesale "crack-down"? The Federal Aviation Agency is spending millions of dollars in the name of aviation safety, in modernizing the airways, in hiring agents and lawyers and engineers to "police" the industry. But hardly a red cent is being expended to figure out ways and means of getting better quality pilots from the thousands of new students taking instruction each year or in developing an educational campaign that not only strikes at the roots of our accidents but also pene-

(Continued on page 59)

for the top of the line . . .

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the all transistor Mitchell Automatic Pilot . . . now available as factory installed equipment on the Cessna 310C . . . brings a new realm of precision flying to business aviation. With positive 3-directional control, the Mitchell Autopilot puts your aircraft on any desired heading in one smooth turn. "Step" turns are unnecessary. With the new Mitchell heading and altitude selectors (optional), you can even dial your heading and altitude before take-off. Once in the air, you simply engage the autopilot and the aircraft automatically flys to the preselected heading and levels off at your desired altitude. **Inexpensive to install and operate,** the Mitchell uses less power than the average cabin lighting system. And when you buy a Mitchell, you get the automatic pilot that's been used on more record-breaking endurance and distance flights than any other make. Let your Mitchell dealer show you how you can get more performance at less cost, with this precision electronic autopilot. $2,425 for 12 volt system; $2,650 for 28 volt system. (Slightly higher with optional altitude or heading selector).

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Max Conrad—poet, pilot and A & E mechanic—receives congratulations from Herb Fisher, tells Fisher how he built six big gas tanks (460 gals.) into this roomy Piper cabin, then sat on one for three days with scarce elbow-room to fly.

Battlecry—"Let's Fly!"

". . . sicker'n a dog—
oh boy!
was that a long night!"

A behind-scenes report on Max Conrad's historic conquest of an ocean and continent—a World Record distance flight in a Piper Comanche specially equipped with new Foul-Resistant Champion Spark Plugs . . .

by Herb Fisher

international aviation authority, veteran test pilot, author

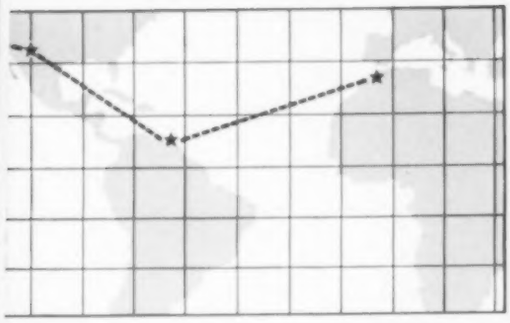
At 2:47 p.m. on June 4—58 hrs.-38 min. after takeoff from Casablanca, Morocco—a 56-year-old grandfather, so parched from thirst he could scarcely speak, landed a Piper Comanche at Los Angeles Airport. Max Conrad had set a new light-aircraft World Distance Record—7,668 miles. Light aircraft or heavy, the only longer flights officially on record are those of a multi-engine Navy bomber—11,236 miles, Australia to Ohio, crew of four—and a KC-135 jet tanker, 10,233 miles, Tokyo to the Azores. Conrad exceeded Pat Boling's recent light plane World Record by 812 miles.

As this shy, Lincolnesque "flying grand-daddy" hit the headlines worldwide, his answers to countless variations of "How'd you do it?" invariably boiled down to this: "Oh, pretty much routine—just sat and flew, that's about all . . . " Max Conrad, alone, really knows what he went through during this lonely conquest of an ocean and continent. In some ways, it was an incredible flight, with conditions most grueling at times; for sure, it was a real "torture-test" of man and machinery.

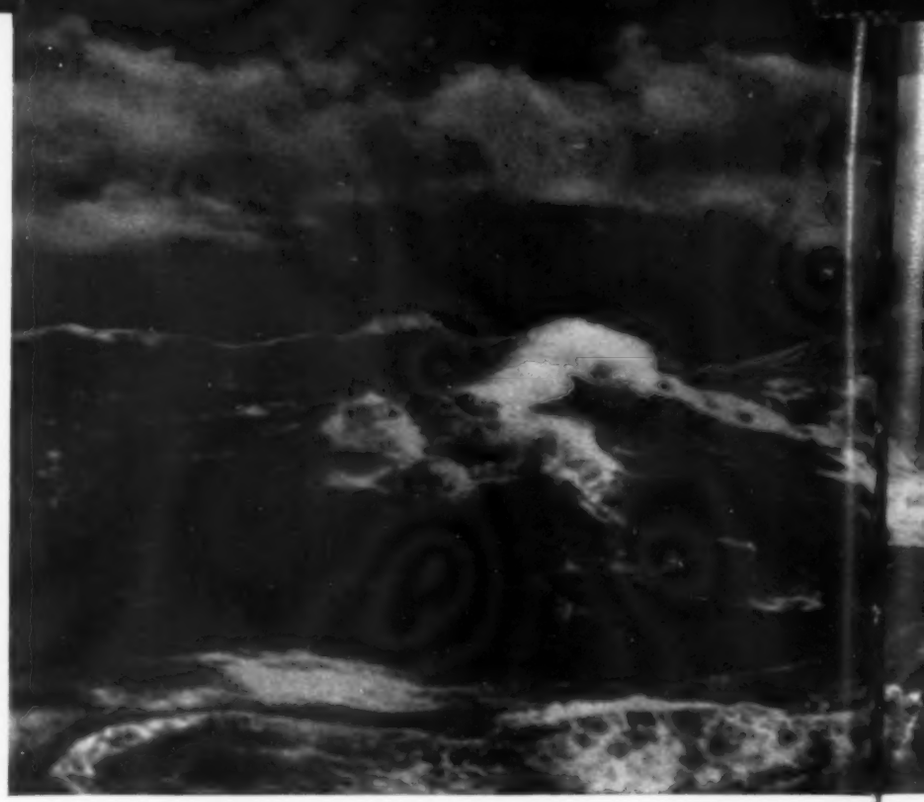
This is the behind-scenes report on that flight:

Tricky Takeoff

Casablanca, June 1. With 520 gallons of B-P 100/130-octane petrol aboard, the Comanche grossed at 5,000 lbs.—*its gross load nearly three and a half times its empty weight.* Arabs and French stood hushed in the Moroccan dawn as the overloaded craft hurtled down the Cazes Airport runway, braked, taxied back, repeated acceleration tests again and again. Max Conrad found he could accelerate



A classic in light-plane achievement: Nonstop, Casablanca to Los Angeles—on a single engine!



to 65 mph. in 900 feet, to 90 mph. in 1,600. He'd inflated tires to 50 lbs., twice normal pressure. He'd pumped up main landing-gear struts. He'd replaced a big generator with a small one; he'd removed starter, cowling latches, handles, door and window trim—all possible weight and drag items from an otherwise standard production-line Piper, selected at random from final assembly in February. Only "extra equipment" besides special radio gear and cabin fuel tanks was an inflatable life raft and a Mae West. He carried 13 quarts of oil—only one quart extra—trusting the 250-hp. Lycoming's reputation for low oil consumption. A new kind of spark plug had been rushed to him by Champion—plugs said to resist fouling-deposit build-up on prolonged flight.

Conrad was all set . . .

June 2, 11:09 a.m. Unfavorable direct crosswind of 8 knots. Unfavorable 6,000-ft. runway with no over-run. He'd have to lift off northeastly, directly over Casablanca . . .

Conrad waved, yelled the slogan made familiar during a life-long crusade to get youth air-minded: "*Let's fly!*"

He "ran scared" down the runway—"these 10 seconds, I'll admit, were full of grave misgivings . . . squeezed into my little cubby-hole, sitting on one gas tank and surrounded by the others I'd built into the cabin, I felt I'd painted myself into a corner and now it was just too late to get out . . ."

At 110 mph. and 4,000 feet down the strip, the plane lifted gently—"I was just plain surprised at how easy it did get off—and boy! those climb-out moments were the happiest and most relieved ones in my life!" The Comanche climbed out over Casablanca at 500 feet per minute *—despite the payload of more than double its own weight.*

Throat dry, Conrad pointed his plane at the Atlantic and reached for the water jug. No water! He'd forgotten it—while remembering everything else. He had only a thermos of coffee and tea . . . no food . . . and one great ocean and one great continent ahead . . .

The "Big Lonesome"

The 3,700-mile Casablanca-Trinidad leg is one of the longest, loneliest stretches in the world, unfrequented by airliners, ships or weather boats. Little weather data is available; navigation aids are nil. Conrad flew dead-reckoning with a standard Piper compass . . . bucking headwinds the first hundred miles, then entering the first of a series of buffeting rain squalls.

Rain and extremely rough air were to plague him throughout his entire 6,000 miles over open seas—though he varied his altitude, in frustration, between 100 and 2,500 feet . . .

Fore and aft of "no-return"—beyond African radio reach and too far out to pick up South America—time was a turtle on an endless racecourse: "You just never know that inner grip of real loneliness—aloneness—until you're stuck there alone with all the vast forces of nature—endless black skies and a mighty empty ocean—and cut off from everybody and everything in the world. It's a funny feeling, like a 'break-off' from the world might be . . . and here I'd had 55 solo ocean-crossings under my belt! . . ."

Conrad picked a wicked rain squall and purposely plunged into it. He held his thermos cup out the window. The torrent swooshed out as fast as it came in. He got nary a drop. "Exasperated, I removed the funnel-shaped antenna-lowering tube and held it out. I got barely enough to wet my lips." Despairfully, he programmed his tea and coffee for one sip per hour . . .

Reconciled to rough air, Conrad relaxed. Drowsiness set in. Drowsiness that was to nag him with increasing frequency as the trip progressed through its second and third day . . .

"To navigate under these conditions, you've got to stay more than awake—*alert!* On Piper AutoControl, it's easy to let the plane fly itself. Squished in with the six big gas tanks, I couldn't move around much to perk myself up. So I staved off drowsiness by straining forward in the seat till it hurt, then sitting back again and forcing myself to think through every step of something I wanted to build—or planning the next steps in my campaign to give children more opportunities in aviation . . ."

Conrad crossed Trinidad at tree-top level—so the Federation Aeronautique Internationale, world governing body

". . . an inner grip of real loneliness, cut off from everybody and everything in the world . . ." Max Conrad, in describing his historic conquest of an ocean and continent for the World Distance Record, June 4, 1959.

for World Record attempts, could officially recognize his plane—at 26 hrs.-39 min. from Casablanca. Average speed so far, 140.8 mph.

Showdown

After Jamaica, night closed in again. And all hell broke loose: Severe thunderstorms raked the entire Gulf of Mexico, blacking out communications and navigation with ADF and putting the overloaded Comanche through a real stress wringer. Pilot? "Well, my minted Arab tea had become rancid, so I was just sicker'n a dog—oh, boy! was that a long night!"

It was a night of illness compounded by "many black hours of doubt." A night of listening hyper-sensitively to the plugs firing that 250-hp. Lycoming as it pulled the heavily burdened Comanche. A night of being alone as he'd never been before . . . Sure, Champion had been firm, unequivocal: "Those plugs are specially designed to resist ordinary fouling-deposit build-up from taxi through prolonged flight, regardless of operational extremes, and to give you smooth full-power all the way . . . it's a major engineering advance, with a new firing-end providing self-cleaning action by combustion gases . . . they're already tested, approved and available for Lycomings and Continentals—" Well, be that as it may, the plugs were "experimental" to him, they'd never had a workout on a flight like this . . . and nobody'd ever flown as far as he aimed to fly . . .

For six hours Conrad was unable to establish communications or get a station bearing. Fearing drift into the mountain barrier of Yucatan if he kept his compass heading, he veered northward—then, flew aimlessly for 500 miles, "just stooging around the Gulf," awaiting daylight and abatement of the violent electrical storms . . .

At 5:33 a.m., Conrad hit the sunny skies of Corpus Christi. Four hours over ETA. (The 500 miles of "Gulf-stooging," if included in his non-stop distance record, would make 8,300 actual miles flown!)

From Corpus on, it was a grueling endurance run, "hugging the desert and keeping an eye and ear on that engine!"

A hero's welcome was set for Conrad at El Paso, original destination. But he'd been figuring: Since Casablanca, he'd gradually reduced power from 131 to 100 mph.-indicated, to extend range, and hadn't touched his two 30-gallon wing tanks yet. Also, despite constant low-power flying and the other adverse operating conditions, the Lycoming engine "was still purring like a kitten, though I was just certain those plugs must be heavy with fouling deposits by now." Scarcely able to speak through parched lips, Conrad radioed: "I'm going to try to make Los Angeles—but

A long and lonely vigil for family, too . . . then—the happy ending!

". . . farther'n any light plane had ever flown, yet the fouling-deposit build-up I expected just wasn't there! It's a remarkable bit of spark plug engineering you people really ought to holler about . . ." Conrad, center, reporting to R. K. Christie (L), Champion Vice-President, Research & Engineering, and R. L. (Doc) Anderson, Aviation Service Manager, on torture-test of new *Foul-Resistant* plug.

I'd sure trade a gallon of gas for a glass of that El Paso water right now!"

With a bevy of airborne newsmen and photographers in tow, Conrad climbed from 100 to 10,000 feet and aimed for the Pacific.

City of Angels

The afternoon of the third day, Max Conrad set down, near mute with thirst and fatigue . . . into the pads, pencils, microphones and cameras of newsmen . . . grabbing a glass of water . . . then, into a phone booth to talk to a daughter in San Francisco . . . then, an hour after landing!—taking off for Santa Ana, a motel bed and a midnight walk "to rest up before sleeping."

"Could have gone another 500 miles," Max told me later. "I had 30 gallons left in my wing tanks. Fuel consumption for the whole trip averaged 8.02 gallons an hour. Speed, 131.1 mph. And oil, just seven quarts! But one of the things I was most curious about, Herb, was this new plug they're calling *foul-resistant:* Well, the mechanic and I pulled the plugs at Santa Ana and took a hard look at those two-prong electrodes, bigger bores and longer core noses.

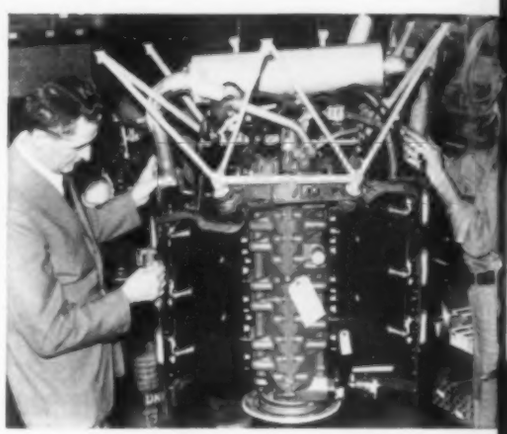
"Herb, the build-up of lead and carbon that I expected *just wasn't there.*

"That different kind of firing-end really let those combustion gases blast 'em clean! After a flight like that—Paris, Casablanca, taxiing, then pulling this load through the bumps to L.A., farther'n any light plane'd flown—it's really a remarkable bit of spark plug engineering that Champion ought to holler about!

"I've had to turn back on flights—a try for records, too—because of trouble.

"But, Herb, I've never made a distance flight like this where *everything* worked so one hundred per cent perfect *all* the time!

"That engine never missed a beat . . ."



Conrad (L) picks a standard 250-hp. Lycoming off assembly line. Fired by a new type of Champion plug, it powered his production-line Piper Comanche to a World Record. The new plugs are now available in RHM 38E, RHM 40E, REM 38E and REM 40E designs for Lycoming and Continental engines.

Reporters press forward so they won't miss a word as Conrad bolts into phone booth, moments after touch-down, and talks to a daughter in San Francisco.

WHO IS MAX CONRAD?

Flyin' Granddaddy—10 children, 7 to 27; two grandchildren . . . 36,000 flight hours; A & E mechanic.

Songwriter—Has composed music fervently for years, mostly while soloing ocean; several love ballads recorded. "Flyer's Rosary" means most to him; "Hills of Sicily" he thinks best. Says "I'd rather write one song that'd last than hold 50 flight records."

Aviator—Paradoxically, studied music, mechanical engineering in college. With orchestra, attended first Ford Air Show, 1926, Detroit; inspired to try to create "flying orchestra." Took flying lessons, quit with 3 solo hrs., bought plane, barnstormed country, instructed. "First student soloed when I had but 38 hours." Owned 2-plane "airline" in '29. Next, charter outfit, flying "personally conducted" sightseeing tours to Calif. War II, headed 6 aviation schools. Next, Northwest Airways, bush-flying Alaska, Canada. Then, 9 years Minneapolis-Honeywell pilot. Now, veteran ferry pilot.

Habitual Lindbergh—First crossed ocean in '48 (Christmas) to visit family in Switzerland: "Too leary of airliners, so, took the Queen Mary!" Made first ocean flight two years later—solo; a Piper Pacer. Now has 56 ocean-crossings, more scheduled . . .

Youth Crusader—Established "airport workshop" for kids in hometown, Winona, Minn. "Grubstaked" promising ones with own time and money. (Most repaid him years later.) *Winona reportedly has produced more airline pilots per capita than any other U.S. city!* — "because kids had a *chance.*" At Congressional hearing in '52, Max interested Congress in nationwide "Winona Experiment," explaining how he'd started Minnesota's with Tri-pacer parts he'd bought for kids to assemble, advocating cities establish Youth Centers with recreational and "aviation workshop" facilities at municipal airports. — FISHER

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SALUTES MAX CONRAD

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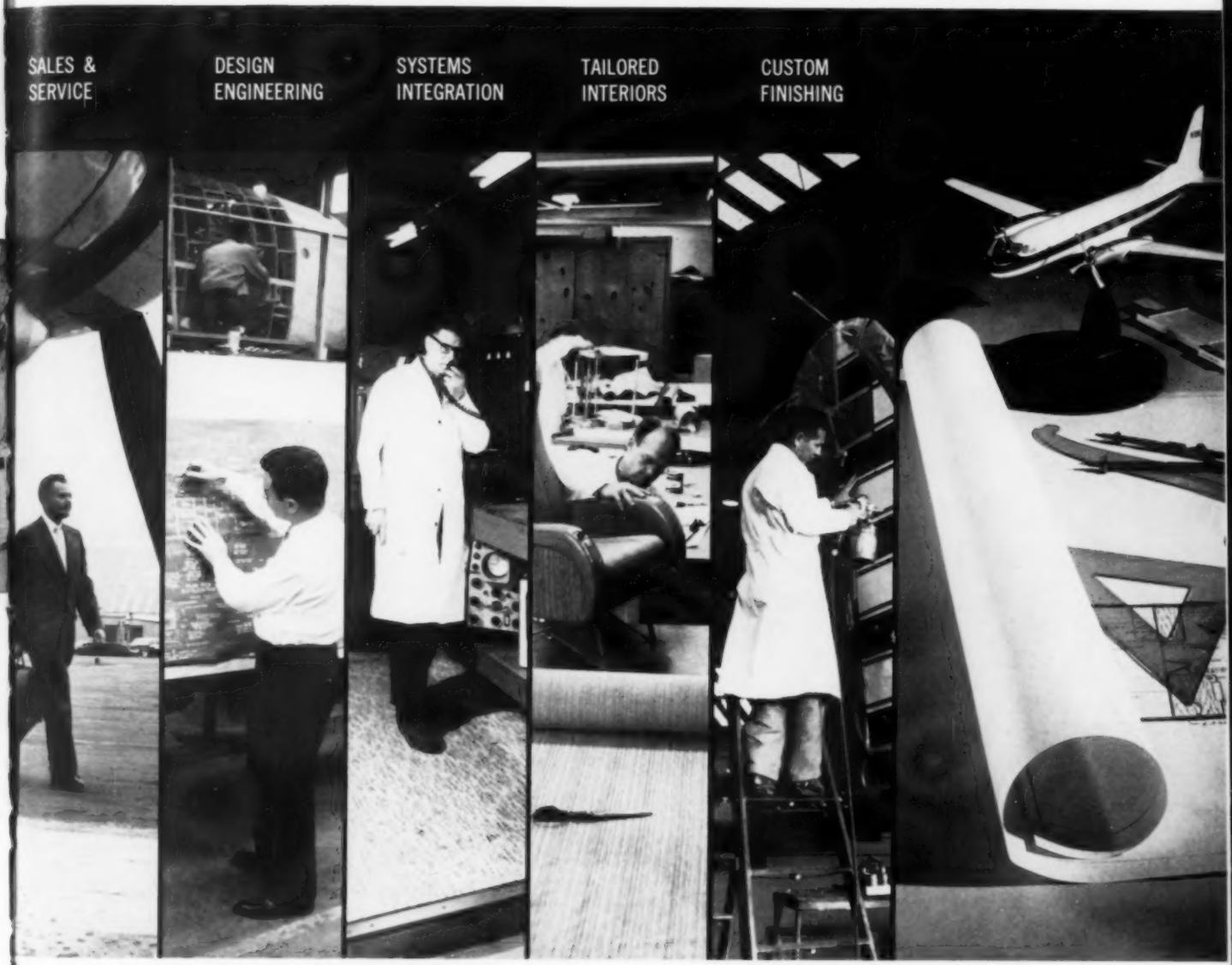

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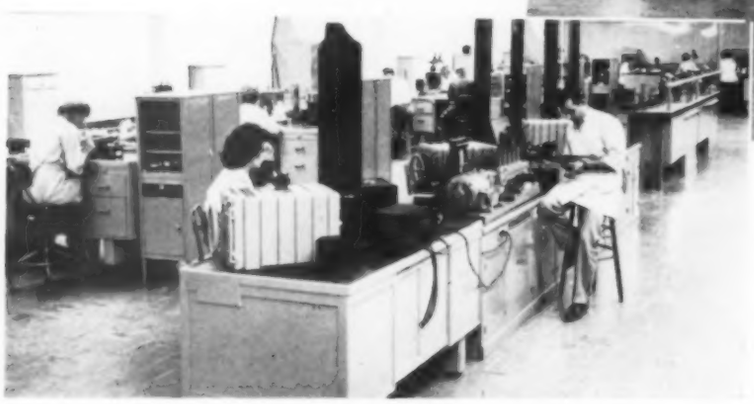

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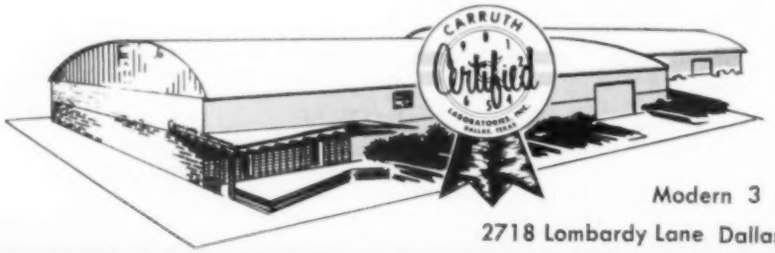

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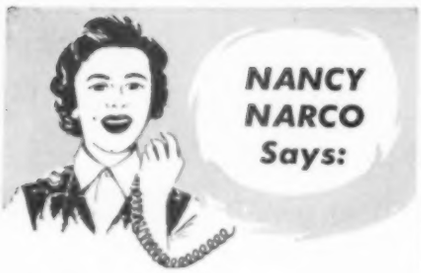

THREE LIGHTS?

Since the Narco engineers dreamed up the little 18-ounce, self-contained, three-light 75 megacycle marker beacon receiver known as the Narco MBT, the reaction has been terrific and the Narco people have set some kind of a production record by grinding out 35 MBT's a day. Couple of thousand MBT's are already blinking merrily in cockpits of airplanes all over the world.

Just in case you're not familiar with a three-light marker beacon receiver, it's quite a helpful navigation aid. When you pass over an LF range station or a fan marker you get a white light blinking at you; over an Outer Marker a blue light; and over the Middle Marker of the ILS an amber light.

Once in a while we run into people who are a little skeptical about the MBT. Some old pros just don't believe you can get a good 75 mc receiver for only $230 . . . less than half the cost of other receivers. Well, all they have to do is talk to DC-3, Lodestar and Twin Beech pilots who've plugged in the MBT and they'll learn that the Narco engineers have pulled a real electronic miracle.

Then there's another group who don't quite see the advantage of a visual marker beacon. They have an aural marker which works fine in their Omnigators, so why bother? Confidentially, I felt the same way myself.

But then I started to think about some approaches I've nearly messed up using an aural receiver. Couple of times the marker was screaming away and I couldn't hear the tower, so I turned off the marker beacon. Then, after finishing my procedure turn I'd grope along the ILS inbound wondering where the Outer Marker was only to realize that I'd forgotten to turn the marker beacon receiver on again.

I figure I've got enough to do with my ears, monitoring approach control, the tower, the ILS localizer. It makes it so much easier and less frantic to see that light blink on and off. And you never, never get any hash from interfering TV signals.

If you VFR pilots think this is way over your heads, take a second look. You, too, can get a lot of navigation assistance from 75 mc beacons. Look at your sectional or WAC charts. You'll see fan markers all over the place which can give you positive position information. When you're approaching an unfamiliar airport you can sound just as professional as an airline pilot reporting over such and such a marker. You're talking the controller's language.

Pardon the "commercial", but a three-light marker beacon receiver is such a handy gadget I just felt I ought to bring up the subject.

Nancy

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WHATEVER YOUR PRESENT EQUIPMENT you'll want to install the *NARCO* MBT

***IF**...you operate larger executive twins, the MBT makes possible dual installation for less weight and cost than a single unit of any other type available.*

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***IF**...you've never used a 75 megacycle receiver, you'll want this handy aid to navigation. Gives positive indication when passing LF range stations, en route fan markers, outer and middle ILS markers.*

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New Cessna Model 210

By GEORGE E. HADDAWAY

IF, as some folks say, competition makes the world go 'round, then the aviation world should twirl merrily in 1960, what with all the brand new and significantly improved models being rushed to completion by the utility aircraft manufacturers.

Among the first of these newsworthy 1960 designs to be announced is the high-performance 4-place Cessna 210, boasting retractable landing gear and the 260-hp. Continental IO-470-E fuel injection engine. Unveiled last month to the aviation press in Wichita, the 210 is in the 190 mile-per-hour class and the first high wing utility airplane in all history to have retractable gear. Retail price: $22,450, standard equipment.

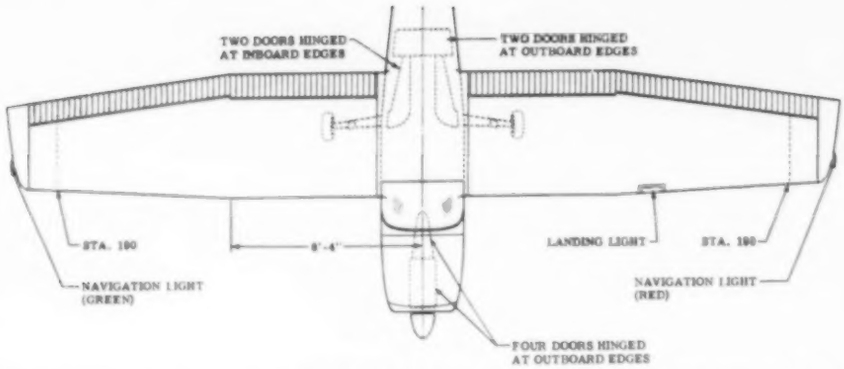
Our brief but illuminating flight in this remarkable airplane confirmed Cessna's conservatism, in advertised performance (see page 30). We've never flown a more stable airplane of any configuration. It was the nearest thing to gyro control in basic design

**First photos of Cessna 210's retracting landing gear show how nose wheel retracts forward and main wheels retract rearward a[ward. E]
fixed-gear Model 182. Note droopi[ngtips]**

we've ever encountered. Little wonder that Cessna sales personnel are so steamed up over the market prospects for the 210, since it is the first time they have produced such terrific performance in an airplane that takes-off, flies and lands as simple and as easy as any other Cessna ever built, including the little 150.

A substantial part of the 210 market probably will be found in the present owners of single-engine Cessnas who want greater performance, higher quality appointments and a more sophisticated product, which is certainly the direction in which the general aviation market is moving. This fact is borne out by Cessna distributors, who already have firm deposits for 210 deliveries even though the customer has only seen pictures

ward a ward. Eight separate doors seal off the wheel wells when the landing gear is both down and up. Model 210 is 20 mph. faster than droopi ngtips and swept vertical tail.



Sketch shows arrangement of eight landing gear doors and planform of new wingtips on Cessna 210.

and studied the performance figures.

The unique retractable landing gear is the same "Land-O-Matic" chrome vanadium spring steel leaf type gear on the other single engine Cessna models, attached to the structure of the airplane in the same way and just as simple despite retraction capability. The structure is more heavily stressed, which makes it even better than the 172-182 models for rough field operations. It's impossible to fold it up while sitting on the ground.

We asked the engineers what the cost and weight penalty was for this unique gear. We were told that it runs around $2,000 in hydraulic system components, retracting mechanism, gear doors and additional structure. Additional weight is about 100 pounds — truly a realistic price for what the purchaser gets.

Cessna Model 210 Cruise Performance

Factory Data

Normal lean mixture, standard air, zero wind, 2,900-lb. gross weight, 55 gals. fuel, no reserve. Performance rpm., 2,450; economy rpm., 2,200.

Rpm.-MP	% Bhp.	Fuel Press.	TAS, mph.	Gals. Fuel Hourly	Endurance Hours	Miles
		2,500-ft. Altitude				
2450-24	75	9.4	181	14.2	3.9	700
-23	71	8.6	177	13.4	4.1	725
-22	67	7.8	173	12.6	4.4	755
-21	63	7.1	169	11.8	4.7	790
2200-23	60	6.6	166	11.2	4.9	810
-22	56	6.2	162	10.6	5.2	840
-21	53	5.7	158	10.0	5.5	870
-20	49	5.3	154	9.4	5.9	900
		5,000-ft. Altitude				
2450-24	78	10.0	188	14.8	3.7	700
-23	74	9.1	183	13.9	4.0	725
-22	69	8.2	179	13.0	4.2	760
-21	65	7.5	175	12.2	4.5	790
2200-23	62	7.0	172	11.6	4.7	815
-22	58	6.4	168	11.0	5.0	840
-21	55	6.0	164	10.3	5.3	875
-20	51	5.5	160	9.7	5.7	905
		7,500-ft. Altitude				
2450-22	71	8.6	186	13.4	4.1	760
-21	67	7.8	181	12.6	4.4	790
-20	63	7.2	178	11.9	4.6	820
-19	59	6.5	173	11.0	5.0	860
2200-22	60	6.7	174	11.4	4.8	840
-21	56	6.2	170	10.6	5.2	880
-20	53	5.7	166	10.0	5.5	910
-19	50	5.3	161	9.5	5.8	935
		10,000-ft. Altitude				
2450-20	65	7.5	184	12.2	4.5	830
-19	60	6.8	179	11.4	4.8	860
-18	56	6.2	174	10.6	5.2	900
-17	52	5.6	169	9.9	5.6	940
2200-20	55	5.9	172	10.3	5.3	915
-19	51	5.5	168	9.8	5.6	940
-18	48	5.1	163	9.1	6.0	985
-17	44	4.8	157	8.6	6.4	1005
		15,000-ft. Altitude				
2450-16	51	5.5	175	9.7	5.7	995
-15	47	5.1	169	9.1	6.0	1025
-14	42	4.6	161	8.3	6.6	1065
-13	38	4.3	154	7.8	7.1	1090
2200-16	43	4.7	163	8.5	6.5	1055
-15	40	4.4	157	8.0	6.9	1080
-14	36	4.1	149	7.4	7.4	1105

Speed-Power Comparison of Cessna 210 and 182

Factory Data

True air speed at 8,000-ft. altitude

Cruise Power	Model 210 TAS, mph.	Model 182 TAS, mph.
120 hp.	158	139
130 hp.	164	145
140 hp.	168	149
150 hp.	173	153
160 hp.	178	157
170 hp.	182	159
180 hp.	186	—
190 hp.	190	—

The main gear retracts aft in the bottom of the fuselage and the nose gear retracts forward, both operated hydraulically with individual actuation cylinders. Main gear cylinders lie in a horizontal position, and swing the main gear aft along the centerline of the fuselage by operation through a rack and pinion gear, sealed in the main gear actuating cylinder. Sealed compartments are located in the underneath section of the fuselage aft of the cabin section for the main gear, wheel and tire. All gears have individual up and down locks.

Gear compartment doors close when the gear is either in an up or down position. These doors also are hydraulically operated and are controlled by a solenoid valve actuated by the pilot's

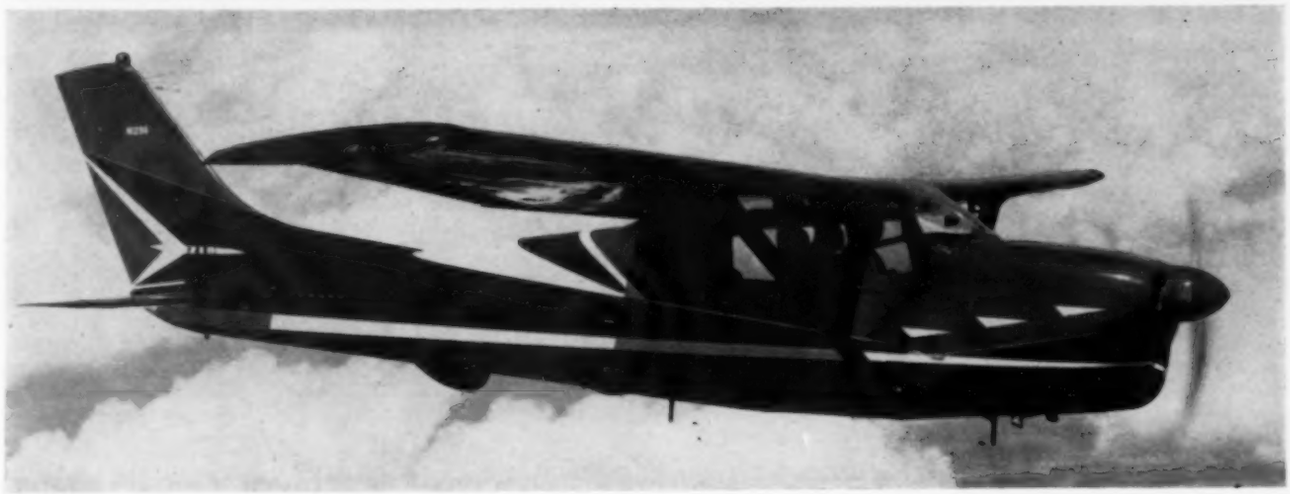
Cessna Model 210

Factory Data

Powered by Continental IO-470-E fuel injection engine rated at 260 hp. at 2,625 rpm.

Price	$22,450
Gross Wt., lbs.	2,900
Empty Wt., lbs.	1,760
Useful Ld., lbs.	1,140
Fuel Cap., gals.	55
Optional Fuel Cap., gals.	65
Top Spd., mph.	199
Max. Recommended Cruise Spd.—	
75% hp. at 7,000 ft., mph.	190
70% hp. at 8,000 ft., mph.	187
Cruising Range, 55 gals., no reserve—	
75% hp. at 7,000 ft., miles	755
70% hp. at 8,000 ft., miles	780
Max range at 10,000 ft., 137 mph., mi.	1,100
Stall Spd., flaps down	59
Rate of Climb, fpm.	1,500
Service Ceiling, ft.	20,700
Abs. Ceiling, ft.	22,400
Take-off Distance—	
Ground roll, ft.	740
Over 50-ft. obstacle, ft.	1,135
Landing Distance—	
Ground roll, ft.	520
Over 50-ft. obstacle, ft.	1,190
Baggage Cap., lbs.	120
Wing Span, ft.	36.5
Length, ft.	26.4
Height, ft.	8.15
Wing Area, sq. ft.	177.5
Wing Loading, lbs. sq. ft.	16.5
Power Loading, lbs. hp.	11.2
Tread, ft.	8.2

NOTE: All performance is for gross weight at sea level unless noted.



Landing gear is shown in these photos in both extended and retracted positions. Note shortness of nose gear (below) and wide tread of main gear (top). Drooping wingtips are also seen in these views. They add to the Cessna 210's spiral stability and also add a total of 2 sq. ft. of wing area. Installation of retractable gear and its mechanisms and structure represents an addition of about $2,000 and 100 lbs. to the basic Model 182 fixed-gear aircraft.

—(Cessna Photos.)

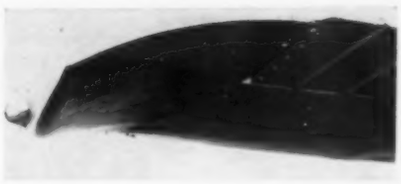
control on the console. The system is designed with a 125 per cent reserve for manual extension of the gear in case of pump failure. The hand-pump lever is adjacent to the gear selector handle on the left side of the console.

Perhaps the most distinguishing feature of the 210 at first sight is the conical-camber wing tips which, with the swept tail, were designed to improve the spiral stability of the airplane. This mission was definitely accomplished. According to the design men, this configuration was arranged to produce additional lift on the downward wing and greater drag on the upward wing in a slipping turn,

Limit Speeds for Cessna 210 and 182

Factory Data

	Model 210 IAS, mph.	Model 182 IAS, mph.
Never Exceed (red line)	200	184
Caution Range (yellow arc)	175-200	160-184
Max. Structural Cr. Spd.	175	175
Normal Operating Range	65-175	64-160
Max. Gear Down Spd.	160	—
Max. Flap Spd.—		
10 deg. flap	160	100
10-40 deg. flap	110	—
Maneuvering Spd.	130	122
Stall Spd., flaps up	65	62
Stall Spd., flaps 40 deg.	59	56



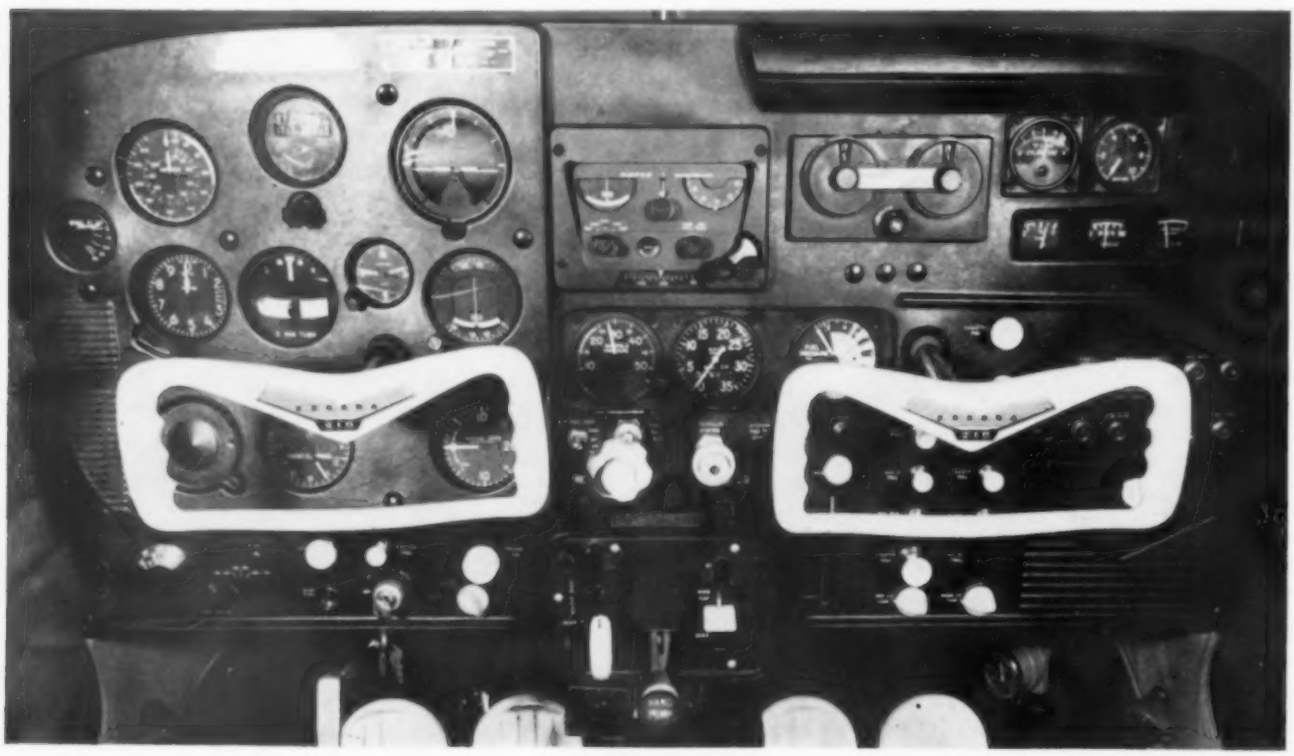
Closeups show new conical camber wingtips on Cessna 210. These shapes increase efficiency and stability.

the theory being that the airflow moving slightly spanwise across the upward wing would separate because of the abrupt droop, and the resulting drag would retard the turn. Since a modest improvement in spiral stability was measured in gliding and climbing flight on the prototype, the conical camber tips were adopted for production. We had thought it might have been employed because of the retractable gear, higher power or cruising speed but this isn't the case.

Also contributing to the effective stability of the 210 is the swept tail. Fin and rudder have been swept a full 35 degrees from the vertical and give the airplane a truly 1960 look in addition to being an asset from a design standpoint. Elevator and rudder trim by controls between the two front

(Continued on page 58)

Interior of Cessna 210 features plush upholstering (top). Baggage compartment (left) has door measuring 18 by 26 ins. Inside dimensions are 34 ins. for length, 21.5 to 35 ins. for height and 18 to 35 ins. for width. Instrument panel has landing gear and flap controls at bottom center below throttle, propeller and mixture controls, with hand pump handle between gear and flap knobs. Note fuel pressure indicator for fuel injection control to right of tachometer. —(Cessna Photos.)



Terminal ramp at Jackson Hole Airport is busy with private planes and airliner. Across broad valley is the majestic Grand Teton Range of rugged granite spires. Air view at right shows 6,300-ft. paved and lighted runway with river in background. Valley floor is at 6,000-7,000-ft. altitude. Jackson Hole is center of fabulous fishing, hunting and vacation paradise.

(FLIGHT MAGAZINE Photos by Price Millward.)

Wyoming Mecca For Airmen

HERE'S proof that if a town, county or state wants an airport badly enough, there's always a way to get one.

The town of Jackson, Wyoming, gateway city to the fabulous Jackson Hole country at the foot of the Grand Teton Range, boasts only 1,600 inhabitants. Some ninety-seven per cent of all the land in Teton County is federally owned, leaving only three per cent of the land as taxable. Most of this land is in national forests and in the Grand Teton National Park, and airports are completely "off limits" in our national parks.

But all these factors were simply minor obstacles to overcome in order to get an adequate airport for the area. Today, the Jackson Airport is one of the outstanding airports of the nation in its size category. With its 6,300-foot hard surfaced runway and as beautiful an air terminal building as you can find anywhere, Jackson Hole Airport is a veritable showplace, the epitome of high-country landing facilities.

Jackson Hole Airport was dedicated only last summer following completion of a $300,000 construction program with one-half coming from the Federal Airport Program and the other half from private contributions, from the County of Teton, the Town of Jackson and the Wyoming State Aeronautics Commission.

As word spreads of this excellent facility more and more airplane owners are discovering one of the most beautiful and unadulterated spots on the North American Continent, bringing welcome dollars into the cash registers of the resorts, business houses, hotels, dude ranches and hunting and fishing camps. The entire area has felt the economic benefits of this attractive aerial gateway since its opening last fall and the citizens consider it a wise investment paying handsome dividends.

The airport is jointly owned by the town and county and is in the national park. It is administered by the Jackson Hole Airport Authority, which Airport Manager Dick Winger told us is a facility — not a legal entity. Winger is chairman of the authority; Mayor Harry Clissold of Jackson, Teton County Commissioner, Chairman Lloyd Bandeburg; Roy Jensen, local businessman and pilot, and Jess Wort, hotel owner, are the other members of the Authority.

"We can't give too much credit to FAA's Hank Kimball out of the Denver office or to George Nelson of the Wyoming Aeronautics Commission,"

Winger explained when we told him this was one of the finest airports of its kind we had ever seen. But it was clear that Dick Winger wanted to give everybody credit for this masterpiece except himself. We later learned that the beautiful native stones inside the lobby of the terminal building were picked up by Winger, who spent many a long hour searching for the moss and lichen covered rocks of the right shape in neighboring canyons.

The operator at the airport is Price

(*Continued on page* 54)

First photo of 1960 Tri-Pacer shows new landing gear speed fairings, which boost cruising speed 4 mph. to 138 mph., and distinctive new paint styling with four stars on tail. Standard Tri-Pacer is $9,340 and fully-equipped Auto-Flite version is $11,970.
—(Piper Photo.)

Piper Tri-Pacer For 1960

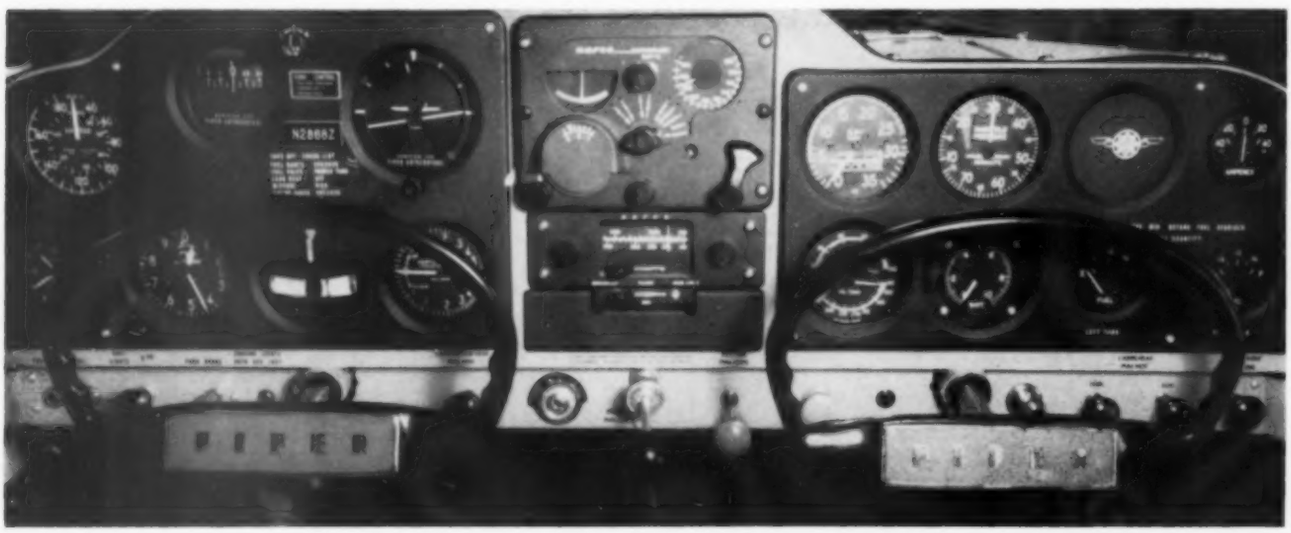
PIPER Aircraft has led the industry in announcing new lightplane models for 1960 with public presentation in September of its new four-place Tri-Pacer and Caribbean, both featuring refinements and optional new speed fairings which boost cruising speed.

The new Tri-Pacer, powered by a 160-hp. 4-cylinder Lycoming engine, cruises 138 mph. with the fairings and is priced at $9,340 to $11,970, up $450 to $650 from 1959 prices. It is offered in three versions — Standard, Super Custom and Auto-Flite, the latter including Piper AutoControl, a transistorized, gyro-controlled stabilizing device for "hands-off" flight except for take-off and landing.

The new Caribbean, powered by a 150-hp. 4-cylinder Lycoming engine, cruises 136 mph. with the fairings, and is priced at $8,795 to $9,750, up $400 from previous prices. It is offered in two versions — Standard and De Luxe.

Piper is currently in production

Fully instrumented panel of Auto-Flite Tri-Pacer has flight group at left, with transistorized AutoControl coupled with both artificial horizon and directional gyro; radio equipment at center, including Narco LFR-3 receiver and Narco Superhomer with omni navigation facilities, VHF receiver and 12-channel VHF transmitter; and engine group at right.
—(Piper Photo.)



Caribbean is economy 150-hp. version of Tri-Pacer and is shown here with optional speed fairings. It is virtually as fast as Tri-Pacer, cruising 136 mph. with the fairings.

—(Piper Photo.)

with the 1960 Tri-Pacer and is turning them out at a rate of 4 airplanes per day. Deliveries of the Caribbean economy models will start November 1.

Other new Piper models yet to be announced include the 4-5-place twin-engine Aztec and Apache, the 4-place single-engine Comanche series, the 2-place, single-engine Super Cub and the specialized agricultural Pawnee workplane.

The Standard Tri-Pacer for 1960 has a useful load of 890 lbs. at a gross weight of 2,000 lbs. and an empty weight of 1,110 lbs. Top speed is 141 mph., cruising speed at 7,000 ft. using 75% horsepower is 134 mph. and this is boosted to 138 mph. with the use of optional speed fairings, which are streamlined wheel pants for the fixed, tricycle landing gear. Stalling speed is 49 mph. Rate of climb is 800 feet per minute.

With standard fuel capacity of 36 gals., an 8-gal. auxiliary tank is available optionally. Cruising range at 75% hp. and at 7,000 ft. is 536 miles with standard fuel and 655 miles with 44 gals. of fuel. This is about 15 miles per gallon of fuel. Service ceiling is 16,500 ft.

Performance of the lower-priced 150-hp. Caribbean is slightly less than that of the Tri-Pacer, speeds being only 2 mph. less with stall speed the same, for example. The Caribbean also has 36-gal. standard fuel supply with 8-gal. aux. tank optional and range is 8 miles less than the Tri-Pacer with standard fuel and 10 miles less than the Tri-Pacer with 44 gals. Factory performance and specifications are summarized in a table accompanying this article.

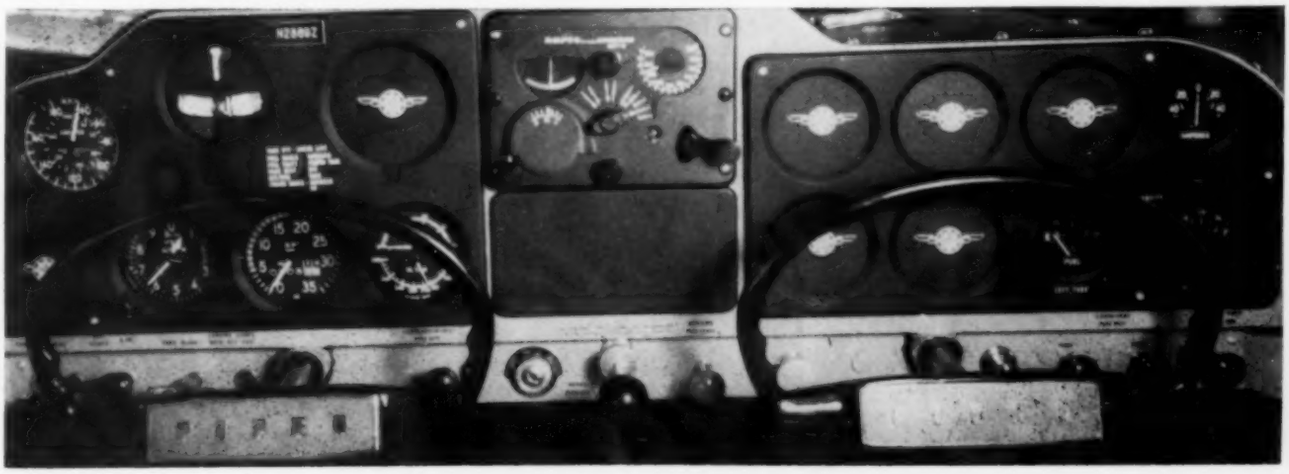
Approximately 90 per cent of Tri-Pacer purchasers in 1960 are expected by J. W. Miller, Piper sales manager, to give the Auto-Flite Tri-Pacer their preference in purchasing the popular 4-place. The Auto-Flite version is completely factory-equipped at its $11,970 price, having a full panel of instruments and radios including omni navigation facilities plus the Piper AutoControl system.

Front and back seats have separate doors on the Tri-Pacer. The two front seats are individually adjustable. The back of the rear seat has been heightened for more restful travel. The rear seat can be removed in 15 seconds to

(Continued on page 50)

Instrument panel for De Luxe Caribbean has turn and bank, sensitive altimeter and Narco Superhomer with omni facilities and VHF transceiver. Standard Caribbean is priced at $8,795, De Luxe Caribbean at $9,750.

—(Piper Photo.)



Reflective runway markings give eerie glow as Apache tanks are topped at 5 a. m. just before Dick Jagitsch (dark suit) took off with right prop removed.

—(Arkansas Aviation Sales Photo by Larry Obsitnik.)

Apache In Record Engine-Out Flight

A PIPER Apache, the smallest twin-engine business plane in production, last month proved it could do what only one other make of business twins has done in all aviation history — with one propeller completely removed, it took off from a standing start and flew more than 1,100 miles. The only other make to do this was the Aero Commander, two of which have performed the feat, but neither stayed up as long or flew as far as the Apache. It stayed up 12 hrs. and 26 mins., traversing 1,304 miles in distance.

Cameraman Larry Obsitnik got this close-up of the one-propped Apache in its record-breaking flight around Arkansas. Tape markers show right spinner is not revolving. Note rudder trim tab.

This, then, is a world's record for twins with one engine inoperative. There is no official requirement, category or recognition for such performance. But the highly competitive utility aircraft industry uses performance as an effective sales tool in its growing drive for wider use of light twins in business flying; for example, the Aero Commander won world fame and sales after it pioneered the engine-out take-off and distance flight in 1951 as the first twin ever to undertake such performance.

The dramatic Apache demonstration was accomplished on August 1 at Little Rock by Arkansas Aviation Sales, Inc., Arkansas distributor for Piper Aircraft. Its sales manager, Dick Jagitsch, made the one-engine take-off and endurance flight in a production-line 1959 Piper Auto-Flite Apache with two 160-hp. Lycoming engines, the right one rendered inoperative by

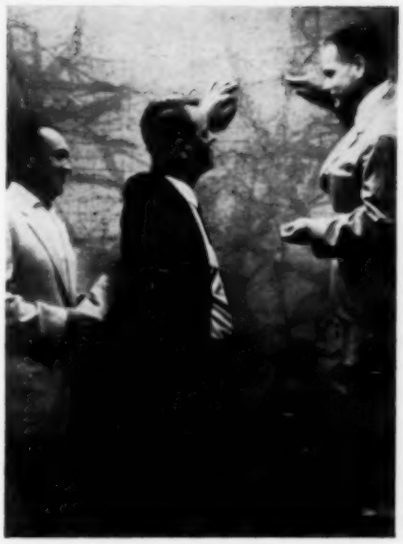
Dave Feltus and Jim Woodard of Arkansas Aviation Sales hold prop from right engine. That's Pilot Dick Jagitsch looking on.

removal of its propeller. The Piper factory had nothing to do with the stunt.

"We did it to prove the Apache not only flies safely and efficiently on one engine, as it is supposed to do in an emergency, but can also take off on one engine, which it is not supposed to do, even in an emergency," said Dave Feltus, president of Arkansas Aviation Sales. "We also did it to shut up unfair competition, which has been unwisely running down the Apache's engine-out capabilities because the Apache is not as large or as powerful as larger competitive twins. We knew the Apache could accomplish world record performance for the simple reason that we had practiced it. So we just went out and did it."

This writer wasn't as sure as Feltus that the Apache could do it. So we interrupted a vacation and journeyed to Little Rock to watch the Apache, having watched the pioneering Aero Commander engine-out take-off and Oklahoma City-Washington, D. C. flight back in 1951 and having only recently interviewed Vic Stadter, the Texas bush pilot who last spring took off from Belize, British Honduras, in a Super 680 Aero Commander with the pistons, cylinders and prop removed from its left engine and flew 1,248 miles around Mexico to Brownsville, Tex.

In Little Rock, Dick Jagitsch was scheduled to take off from Adams Field at 5 a. m., so we got out to the airport at 4 a. m. to watch the preparations. We say "scheduled" because Jimmy Woodard, vice president of Arkansas Aviation Sales and quite a showman, having been a radio sportscaster before entering aircraft sales work, had planned the Apache hop weeks in advance, setting take-off time as 5 a. m. on August 1. But there were no preparations between 4 a. m. and 5 a. m. as we expected. All that was necessary was to take the right prop off and this had been done the day before. Some strips of masking tape were



Dick Jagitsch (center), Jim Woodard (left) and Dave Feltus check route for single-engine flight just before dawn take-off.

used to mark the spinner, which was re-attached after the prop was removed. These marks would show that the spinner was not turning in flight.

Otherwise, the Apache was strictly stock. This was the Auto-Flite model, meaning that the Apache was the de luxe version and fully equipped with instrumentation and radio gear for instrument flight plus a transistorized Mitchell autopilot system. It was a brand new Apache, with only 12-odd hours of operation. We would personally prefer to use an airplane with

Apache in which Dick Jagitsch took off with right prop removed and covered 1,304 miles while aloft over 12 hrs. is brand new 1959 Auto-Flite version.

—(Larry Obsitnik Photo.)

Engine-Out Flights by Twins Compared

FLIGHT MAGAZINE Compilation

	Piper Apache	Aero Commander Super 680	Aero Commander Prototype
Date of Flight	8/1/59	4/6/59	5/9/51
Pilots	Dick Jagitsch	Vic Stadter	B. Bantle; E. Morris
Take-off Hp.	160	340	260
Gross Wt., lbs.	3,170	6,000	4,853
TO Pow. Loading, lbs. hp.	19.81	17.64	18.66
Fuel Load, gals.	108	223	160
Distance Flown, miles	1,304	1,248	1,160
Hours: Minutes Aloft	12:26	7:15	7:55
Average Speed, mph.	105	170	147
Cruising Altitude, ft.	600-3,000	3,000-12,500	3,000-5,000
Fuel Consumed, Gals.	93	210	117
Average Fuel Consumption, gph.	7.4	28.9	13.6

NOTES: Apache had right prop removed, took off from Little Rock and landed at Little Rock after making double circuit of Arkansas. Aero Commander Super 680 had left prop, pistons and cylinders removed, took off from Belize, British Honduras, and flew to Brownsville, Texas, with fuel capacity listed as 223 gals. Aero Commander prototype had left prop removed, took off from Oklahoma City, landed at Washington, D. C., and was piloted by factory flight test crew.

100 hours or more on its engines and equipment for a record attempt, because most minor deficiencies usually show up during the first 25-100 hours of operation. But the people at Arkansas Aviation said the Piper factory had reached a high degree of quality control in making ready new equipment for delivery and that experience had proved that modern Apaches are just as reliable right off the delivery ramp as they are after the first 100-hr. check. So everybody was ready to go.

The tires had been aired 5 lbs. over normal. This would reduce friction drag to a minimum on the take-off roll. After taxiing out to the end of the runway, the tanks were topped, giving the Apache a full load of 108 gals. of fuel. It was not quite light enough at 5 a. m. for television cameramen, so the take-off was delayed until 5:21 a. m.

Several of us wanted to watch the take-off from the intersection and were being driven down the runway in an auto when somebody on the back seat happened to glance back and started screaming: "Here he comes — get off the runway!" As the driver pulled off on the grass near the intersection, Jagitsch flew by. We say "flew" because he was already off the ground and flying, having taken off after a run of only about 3,500 ft.

The apparent ease of this engine-out take-off was amazing to us as we watched the Apache lift into the air after a run almost as straight as an arrow from a standing start with only the left propeller operating. He started his run from just to the left of the center line, adding power easily while holding his direction with the steerable nosewheel. But the build-up of power with the good engine was steady and strong enough to get the Apache past the danger zone between 50 and 85 mph., the latter being minimum single-engine control speed.

The acceleration was so rapid that the Apache had 95 mph., at which point the pilot flew it off gently, only 3,500 ft. from the start of his run. When he left the ground he had drifted only slightly to the right side of the runway from the off-side pull of the left propeller. The little nacelles for the 4-cylinder, 160-hp. Lycoming engines are so close to the fuselage that the Apache pilot does not have to fight as much yaw as with larger twins with more powerful engines and bigger propellers. Its rudder is effective at relatively slow speeds, and Jagitsch had no difficulty holding his wings level after he left the ground.

Because the Apache's best single-engine speed is 95 mph., the pilot had everything in his favor when he passed 85 mph. on the ground—most of his accelerating had been accomplished

(Continued on page 50)

Record Apache flight was staged by Arkansas Aviation Sales, Piper distributor, to dramatize Apache's safety and efficiency virtues. Firm's Little Rock hangar is large new facility which leads all Piper distributors in percentage of quota sales.

Tempo II has modern new pressurized fuselage with crew of two and cabin seating 7 to 10 executive passengers. Wing, landing gear and tail are from Douglas B-26. Engines are 2,100-hp. R-2800-C's.

L. B. Smith's Tempo II Business Liner

By TOM ASHLEY

A NEWLY designed and completely pressurized, 350-mph. corporate aircraft for business flying, the 7-10-passenger Tempo II, has entered production at Miami and the prototype is scheduled to make its first flight in October. Engineered and produced by L. B. Smith Aircraft Corporation, it features airline-proven power plant and pressurization packages.

The 35,000-lb. Tempo II, with an empty weight of 23,000 lbs. and a range of more than 2,200 miles, is priced in the $400,000 bracket. It is being marketed in several versions, including an unpressurized model at a price to be announced, and is intended to fill the gap between the popular 180-250-mph., $160,000-$450,000 DC-3-Lodestar-Convair category and the new turbine-jet, 300-550-mph., $750,000-$1,000,000-plus Friendship-Gulfstream-Jetstar category.

L. B. Smith Aircraft developed the Tempo II from the famous Douglas B-26 but, instead of merely converting the Twenty-six, LBS engineered and is producing for it a complete new fuselage designed for flying passengers at efficient altitudes with performance, pressurization, cockpit and cabin advantages not available in any B-26 conversion.

Tempo II

Design Performance and Specifications

Take-off Hp.	4,200
Take-off Gr. Wt., lbs.	35,000
Landing Gr. Wt., lbs.	31,000
Empty Wt., lbs.	23,000
Useful Ld., lbs.	12,000
Fuel Cap., gals.	1,170
Optional Fuel Cap., gals.	1,370
Cr. Spd., 67% hp. @ 20,000 ft. and @ 31,000 lbs., mph.	350
Cr. Range with 45-min. res., and 1,370-gals., miles	2,200
Stall Spd. @ 35,000 lbs., flaps and gear extended, mph.	95
Rate of Climb @ sea level, fpm.	1,650
SE Rate of Climb at 5,000 ft., fpm.	300
Runway Requirement (CAR 4b), ft.	4,130
Landing Distance over 50-ft. obstacle, ft.	3,200
Span, ft.-ins.	71-4
Length, ft.-ins.	60-1.5
Height, ft.	20
Wing Area, sq. ft.	558
Power Loading, lbs. hp.	8.33
Wing Loading, lbs. sq. ft.	62.7

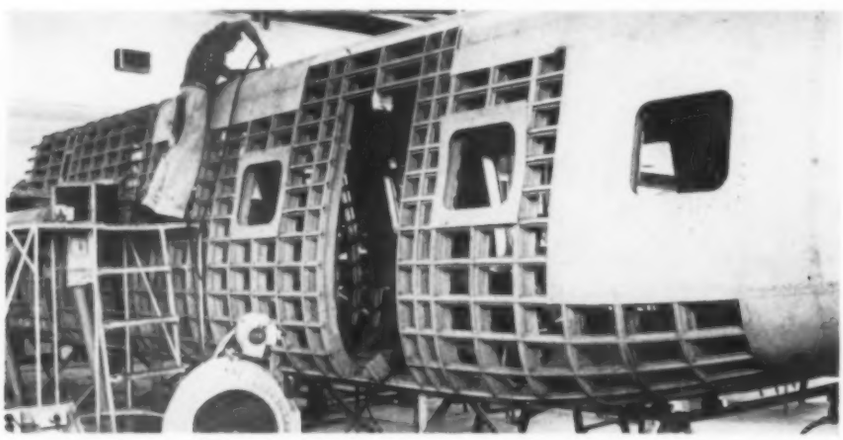
Note: All performance is for gross weight at sea level unless noted.

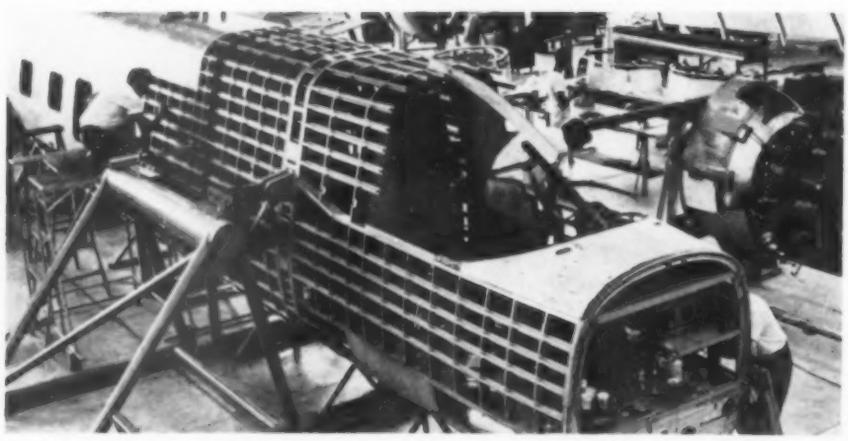
While Tempo II will be certificated under CAR 9 for limited category aircraft, all changes and modifications are being accomplished in accordance with CAR 4b requirements.

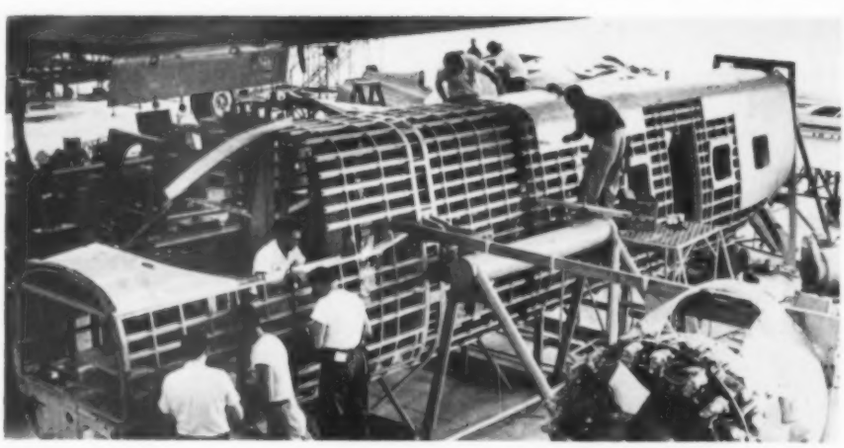
For its larger and longer fuselage, LBS retained the wings, tail and landing gear which made the B-26 the most reliable and highly-perfected high-performance airplane in military operation during the war. But with airline R-2800 "C" series engines, the new Tempo II offers considerably improved performance over the B-26 — higher cruising speed, better short-field performance, lower landing speed, greater cruising range and better handling characteristics including improved engine-out performance.

These are the features which only a complete new version could give the B-26, without which the famous airplane never had a chance of providing business flying its full high-speed travel capabilities. Handicapped as it was with small, make-shift military cabin compartment and lack of pressurization which pegged its operations well below its most efficient opera-

Outlines of new fuselage over B-26 show longer nose, larger cabin and longer tail of Tempo. Photos below show new fuselage's pressure vessel construction with 5 by 11-in. panels and wing-attach points for new ring spars (front spar frame is shown but rear one had not been put into place when FLIGHT MAGAZINE photos were made). Note doorway, cabin height inside, DC-6 window openings and side-by-side cockpit area.







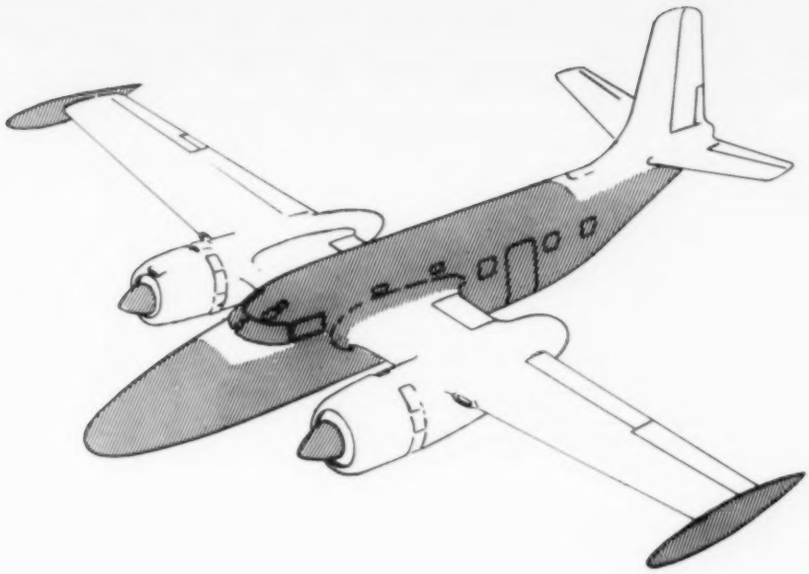
tional altitudes, the B-26 became a highly-valued executive aircraft for a few corporations and individuals. In contrast, the even better Tempo II is expected to become a more widely-used modern workhorse of the corporate flying fleet because of its many improvements over the B-26 and its speed-comfort-handling-economy superiorities over the DC-3's and Lodestars it will replace.

A major project, the Tempo II program at LBS is impressive. No quickie conversion deal, it was begun more than a year ago. We visited Miami in 1958 and saw LBS perfecting completely new electric and hydraulic systems. Herrol Bellomy, executive vice president, announced plans for Tempo II in an article in FLIGHT MAGAZINE in October, 1958, and at the National Business Aircraft Association convention at Philadelphia, after his program was well under way, with Ed Brush, vice president and head of engineering, and his staff deep into the design of a completely new and pressurized fuselage.

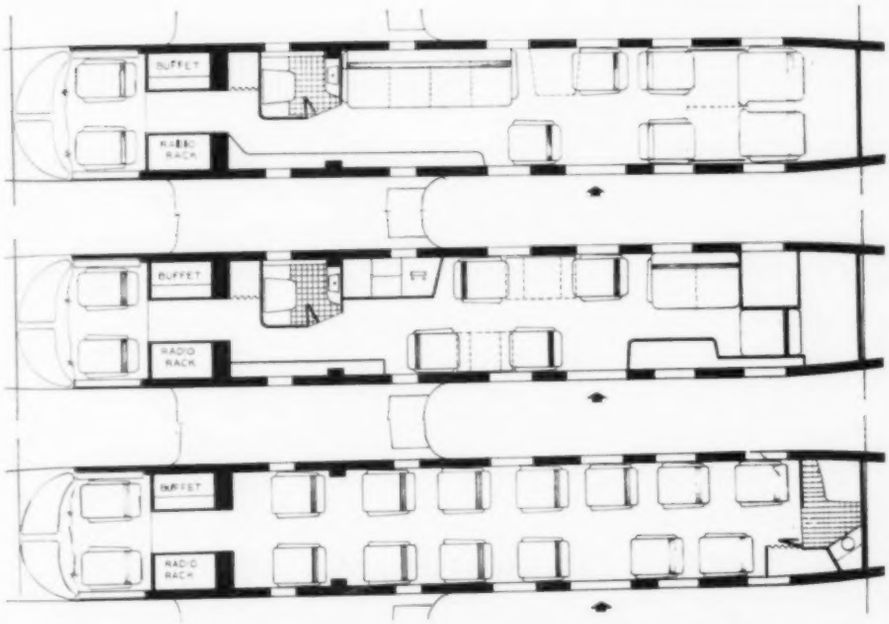
Bellomy's announcement brought in so much response that he intensified the program, giving it greater priority among various LBS projects, and brought in Carl Wootten as sales manager to establish a full sales department. Former sales manager for Beech and Aero Design, Wootten is marketing the high-performance airplane with a team of factory representatives.

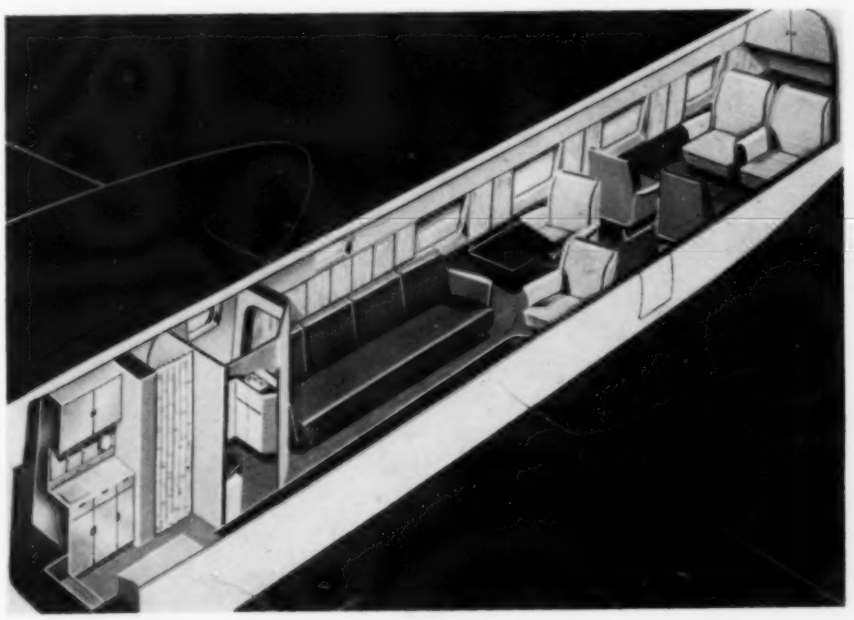
We re-visited LBS in Miami recently and saw the new fuselage and cabin in production. Two major factors dictated the design of the fuselage: (1) Pressure-vessel construction for operations at efficient altitudes and (2) interior cabin dimensions spacious

Close-up view of massive ring spar's wing attach point.



New construction in Tempo II is indicated at right by shaded areas. Three interiors are suggested in floor plans, with cutaway at bottom showing galley, wardrobe, lavatory, 4-place sofa and six chairs. Dimensions for three-view above are: Span, 71 ft. 4 ins.; length, 60 ft. 1.5 ins. and height, 20 ft.





enough for full-size corporate-standard cabin comforts and walk-through access to an enlarged cockpit.

Fifteen years of industry experience with cabin pressurization have long since eliminated all of the mysteries from pressure-vessel construction, so that cabin pressurization posed no special problem. Structure consists of lateral frames with 11-inch maximum spacing and longitudinal stringers on 5-inch maximum spacing. The design and construction are capable of withstanding differentials of over 8 lbs. per sq. in., although maximum pressurization will be 4.17 lbs. per sq. in., duplicating that of the Convair 340-440 series and providing for an 8,000-ft. cabin while flying at 20,000 ft. At 9,000 ft., cabin altitude is sea level; at 12,000 ft., it is 2,000 ft. and at 16,000 ft. cabin altitude is 5,000 ft. Off-the-shelf equipment is used, with engine-driven nacelle-mounted Stratos compressor and an air cycle unit of the Fairchild F-27 type mounted in the wing roots. Barber Coleman automatic control is used for both heat and air conditioning, with cooling turbine and compressor in one wing root and heat exchanger in the other.

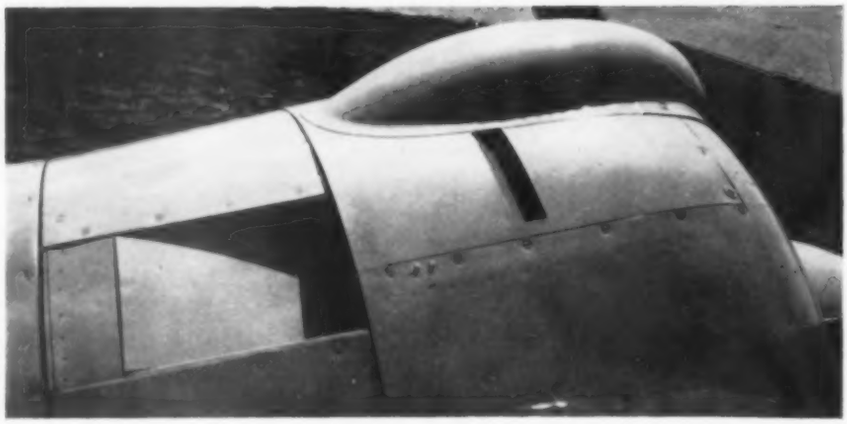
Fail-safe standards of the cabin

(Continued on page 57)

Parker Construction's Lodestar has new engine cowl and other Dallas Aero modifications. Fred Clayton, pilot, reports 252-mph. cruise at 10,000 ft. using 690 hp. per engine. —(Dallas Aero Service Photo.)

Safety-Speed-Stability Lodestar Package

MANY modernization improvements, perfected down through the years, have kept the venerable Lockheed Lodestar in the forefront of the nation's executive air fleet to prove its versatility and usefulness as one of the great aircraft design classics. Latest improvement is a new engine cowling perfected by Dallas Aero Service — it reduces drag for a speed increase but primarily gives the pilot, for the first time, positive control of engine temperatures and improves carburetor heat.



Many are the recent modifications which have made the Lodestar a much better airplane than the original and the new engine cowling serves to focus attention on ten basic kit modifications included in Dallas Aero's "safety-speed-stability" package for Lodestars.

To illustrate the completeness of the package available to Lodestar owners, here's a checklist of the safety-speed-stability program as detailed by Dallas Aero's Major Bill Long and his chief engineer, Walt Clark:

1. *Tail Section and Wing Flap Modification; adds 10 mph. and 12.5 lbs.; costs* $5,595. Consists of: Increase horizontal stabilizer angle of incidence; install saddle fairing; install stabilizer short tips; install fin-stabilizer intersection probe fairing; install elevator-stabilizer flap closure; remove bat wings; shorten flap tracks; limit flap travel to 70%; rework wing trailing edge and flaps to eliminate flap track extension housings and incorporate knife-edge-closure fairing extensions.

2. *Tail Cone and Elevator Modification; no speed change claimed; adds 1.5 lbs.; costs* $1,795. Consists of: Remove existing tail cone and elevator flipper; manufacture and install new

Close-ups show new streamlined engine cowling for 1,350-hp. Wrights on Parker Lodestar. Note flush accessory cowling containing inward-opening cowl flaps. These provide exact control of engine temperatures.

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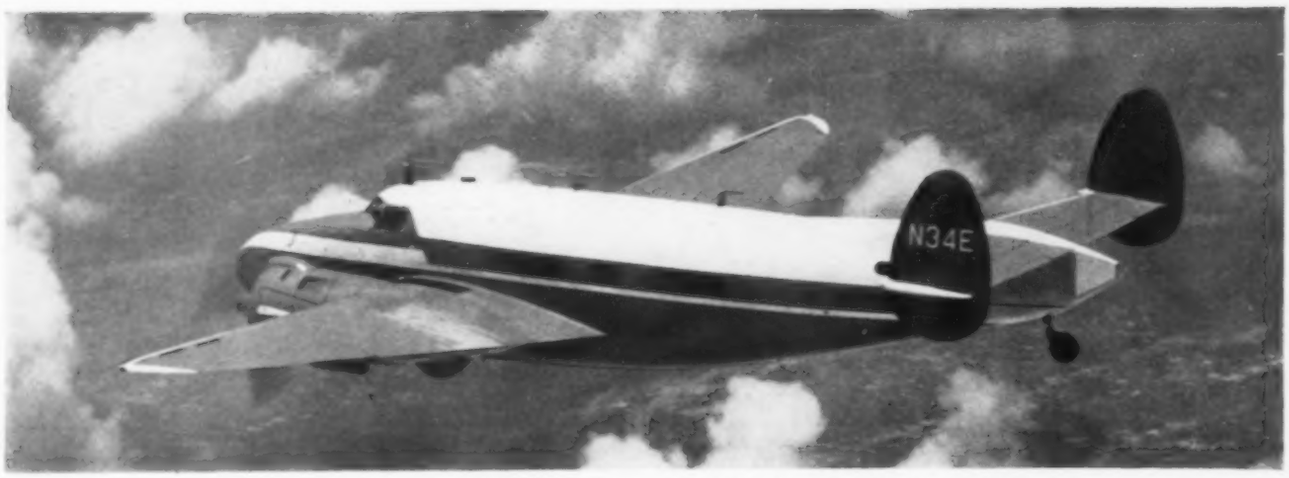


Rear view shows Parker Lodestar's tail cone, stabilizer, elevator and saddle-fairing modifications. Tail cone gives better slow speed handling, eliminating elevator dead spots.

type tail cone; extend elevator inboard ends to conform to new tail cone. This eliminates instability caused by flipper seeking neutral position, especially at slow and near-stall speeds, and reduces elevator up-position load.

3. *Landing Gear Nacelle Wheel Door System; adds 9 mph. and 40 lbs.; costs $3,850.* Consists of: Install three doors on each nacelle of which the two at the wheel are in closed position with gear up or down. Fairing on strut is removed and nacelle fairing is modified to incorporate use of a door.

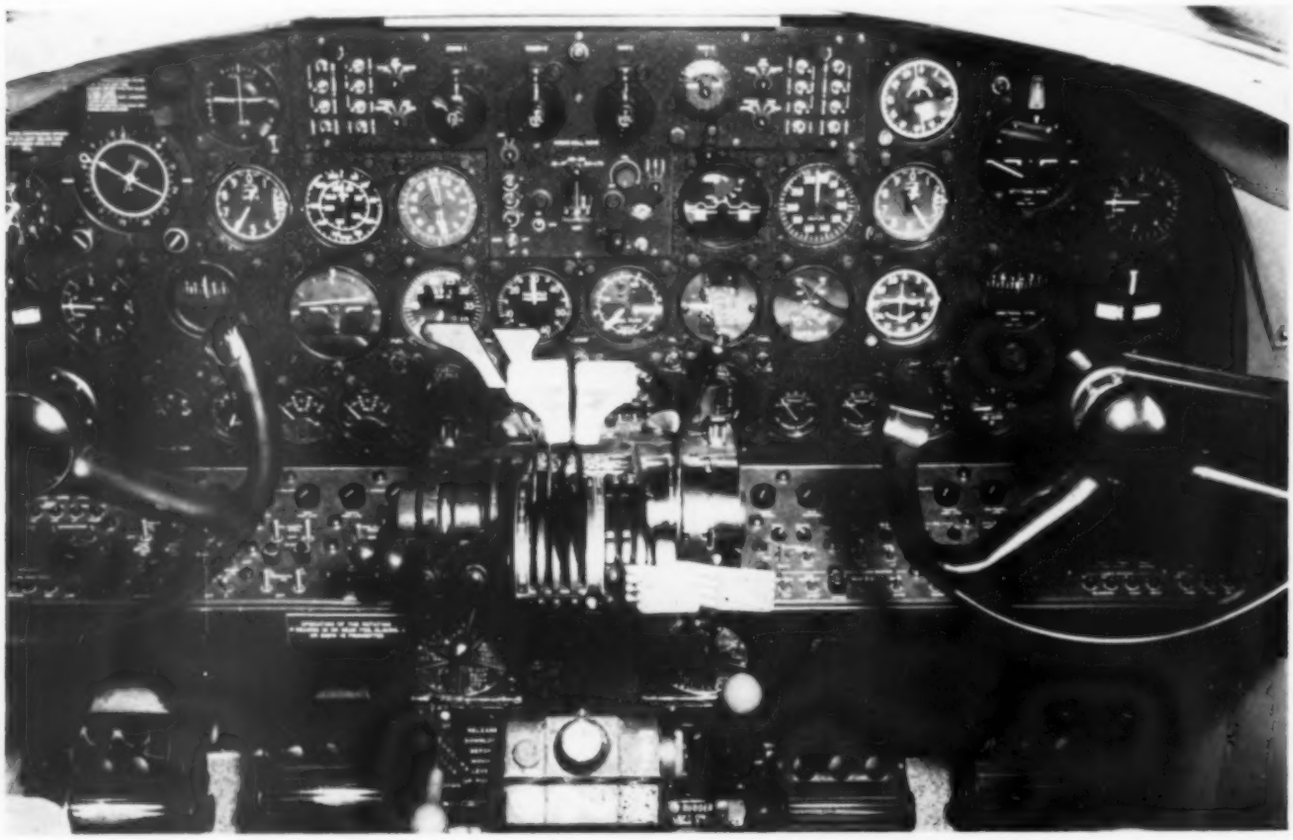
4. *Radar Nose Fairing; no speed change claimed; adds 53 lbs.; costs $4,500.* Provides for radome and more streamlined nose with air inlet for cabin heat system. Nose fairing and tail cone actually add 4 mph. but no speed change is claimed because speed is not primary factor.

5. *Engine Exhaust Short Stack; adds 2 to 4 mph. and 15 lbs.; costs $3,300.* Consists of: Remove exhaust system; re-skin nacelle and enclose former tail pipe well; install new flange-mounted exhaust system; install new short tail pipe; install stainless steel shroud around short stack; rework carburetor intake scoop; install pulley and cable type carburetor heat control; re-route propeller control cable. Note: by removing existing cabin heat system, another is needed and the ground and defrost blowers create increased weight.

6. *Aerodynamic Cleanup; adds 4 mph.; reduces weight by 32 lbs.; costs vary according to work needed.* Consists of removing or relocating anten-

(Continued on page 68)

Dallas Aero custom panel locates all switches and circuit breakers on knee panel and locates radio controls and switches at center, eliminating eyebrow, overhead and bulkhead panels. —(Dallas Aero Service Photos.)



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NEW SPEED, NEW STYLING, TOO

for the 1960 PIPER Caribbean

The four-passenger Piper Caribbean–150 horsepower version of the Tri-Pacer designed especially for airport operators, flying clubs and private pilots–is also available for '60 with streamlined fairings that increase cruising speed by 4 mph. Here's the most economical airplane to buy and fly... is safely flown at reduced power using as little as six gallons of gas an hour. Price is only a little more than the price of other two-place airplanes... **ONLY $8795.**

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YOU GET new styling... new performance... new speed in the Piper Tri-Pacer for 1960. Optional landing gear speed fairings add new beauty, keep airplane cleaner, *add four miles an hour to cruising speed!*

For all-around performance–in climb and level flight, at high altitudes, flying in and out of rough fields–the Tri-Pacer for 1960 outperforms any other airplane in its class. Its 160 horsepower Lycoming engine is unmatched for reliability, ease of maintenance, long operating periods between overhauls.

AUTOMATIC FLIGHT!

The effortless ease of automatic flight is also yours in the AutoFlite model of the 1960 Tri-Pacer. With Piper's exclusive AutoControl you fly "hands off", hold a precise cross-country heading or make turns automatically, fly with added safety.

Thoroughly proven, vastly improved, the new 1960 Tri-Pacer combines the most features to simplify flying with really practical cross-country speed. And wait till you see the beautiful new interior!

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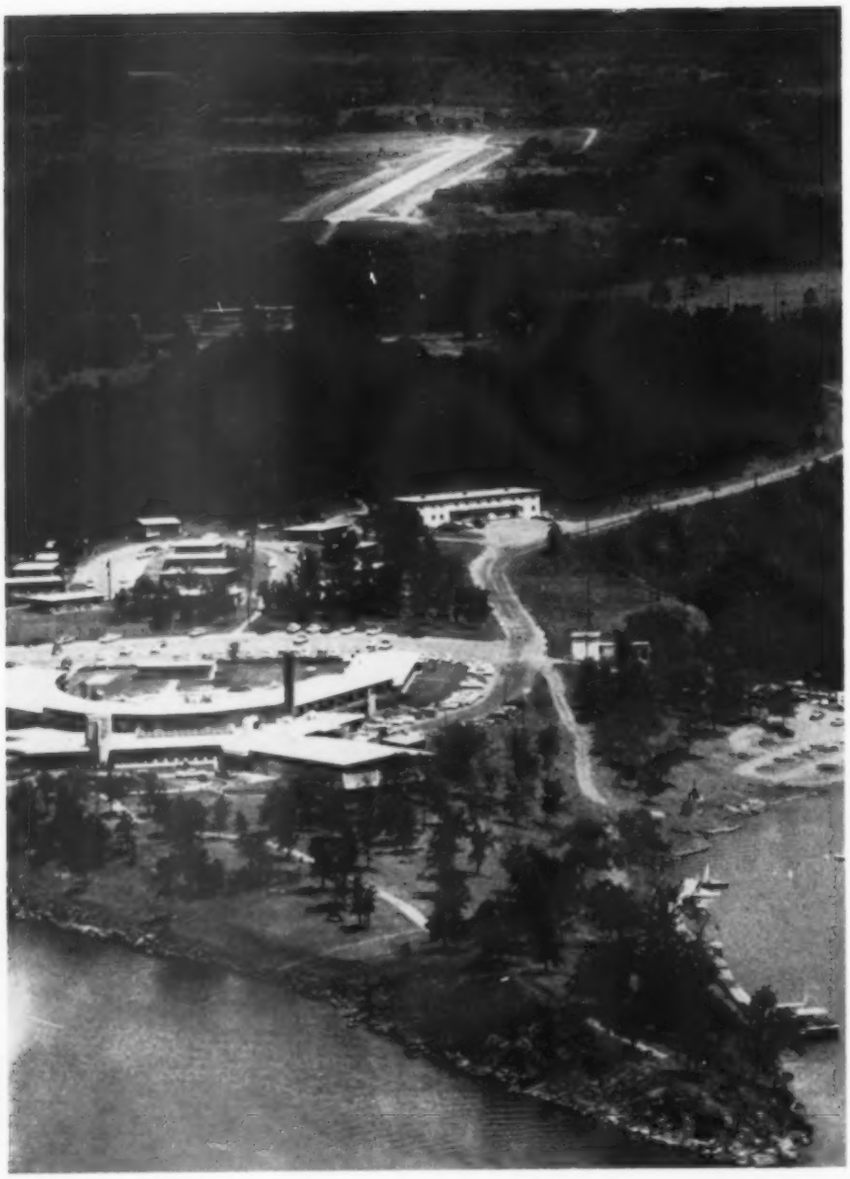

Paved 2,500-ft. airstrip (air view shows strip less than mile from Lodge) and seaplane dock at front door make Western Hills Lodge a favorite with airmen. Ross School of Aviation in Tulsa gives flying lessons at strip and G. F. Maloc-say of Miami, Okla., gives seaplane instruction and rides at dock.
—(FLIGHT MAGAZINE Photos.)

Oklahoma Air Resort

WE have enjoyed many of the growing number of resorts catering to fly-in guests all over the United States, Mexico and Canada, but the most complete all-round family-type fly-in resort we have visited is Western Hills Lodge in Oklahoma, near Tulsa. We tried it out last month and it was difficult to pack up and leave at week's end after getting into the swing of all of its many planned activities, air-conditioned luxuries and beautiful scenery.

First big aviation activity for Western Hills Lodge was to open in September with many of the nation's flying doctors gathering there for a convention of the Flying Physicians Association. Other aviation conventions and tours are bound to gravitate to this plush resort after the medicos carry the word back home.

But whether there's a meeting to attend or not, anybody with an airplane and a yen to go some place will enjoy this fine year-round resort. It is located 40 miles southeast of Tulsa on Fort Gibson Reservoir in the heart of Sequoyah State Park near Wagoner, Oklahoma. This is in the rolling, oak-timbered Indian territory of Eastern

From their Apache, Joe Cannon and Joe Ross of Tulsa, Oklahoma Piper distributors, and Jim Stevenson, Piper dealer at nearby Muskogee, watch a Cessna land at Western Hills Lodge. — (FLIGHT MAGAZINE Photos.)

Oklahoma, adjacent to the wild Cookson Hills and near the Ozark country of Arkansas.

There's a telephone box on a pole at the 2,500-ft. hard-surfaced airstrip 2 miles around a small bay from the Lodge. It's connected to the Lodge switchboard and a call from it will bring a station wagon to pick up guests landing there. But to make sure of accommodations, call for reservation before you leave home. This airstrip has clear approaches and DC-3's use it. A seaplane dock is operated right at the Lodge's front door on the lake.

What are you looking for — fishing, swimming, water-skiing, land or seaplane flight instruction, horseback riding, speedboating, golfing, good food and relaxation, dancing, moonlight barge rides, bingo parties, conducted tours of Indian Territory, trail rides and outdoor breakfasts and chuck-wagon barbecue dinners? All of these activities make this resort complete and its staff has something planned every day for everybody in the family.

More people are learning to fly on their vacation at resorts having air strips. Western Hills Lodge is listed

(Continued on page 54)

Water skiing (above), speedboating, swimming and fishing are favorite sports at Western Hills. Big pool at plush resort is shown in air view below. Note seaplane dock in background. Seaplane hops at $3 and water flying instruction at $20 per hour are popular with guests. Seaplane instructor is H. N. (Major) Langley. — (FLIGHT MAGAZINE Photos.)

Here's 1960 Piper Caribbean with and without landing gear speed fairings.

TRI-PACER FOR 1960

(Continued from page 35)

provide 42 cubic feet of cargo space with a capacity of 600 lbs.

Completely restyled, the interior has oyster white headlining and light grey trim, with upholstering and light grey fabrics available in four colors to harmonize with standard exterior colors of Santa Fe red, Bahama blue, Hershey brown and Montego green, teamed with Daytona white. Four white stars on the tail surface distinguish the exterior design of the 1960 Tri-Pacer.

The Caribbean version of the Tri-Pacer is Piper's newest economy 4-place model, having the Tri-Pacer's flaps, metal propeller and dual controls as standard. It is offered especially for airport operators, flying clubs and private pilots. For student instruction, it can be operated at reduced power.

The De Luxe version of the Caribbean has instruments and radio for communications and navigation in cross-country use.

SINGLE-ENGINE APACHE

(Continued from page 38)

and the airplane was ready. Twins with best-single-engine climb speeds more widely separated from minimum control speed are more difficult to accelerate for climbing out from a take-off. But Dick Jagitsch just held the nose up from take-off and climbed right on out at better than 300 feet per minute. The temperature was 78 degrees F., altimeter setting was 30.01 and humidity 90. His Apache was grossing only about 3,200 lbs., or about 600 lbs. under normal gross. At this weight, with both engines operative, the Apache will get off the ground in standard air after a run of only about 600 feet or less. Jagitsch used about six times this distance with one engine inoperative. Had he grossed the normal 3,800-lb. load, his take-off distance would have been greater and his single-engine rate of climb less.

Absolute single-engine ceiling for the Apache with 160 hp. engines is 5,500 ft. at gross weight, but this increases at less than gross weight with fuel burnoff or reduced cabin loads. At any rate, Jagitsch began his cruising flight at 2,200 ft. and was later forced by thunderstorms and weather to cruise at several levels between 600 ft. and 3,000 ft., never reaching the Apache's altitude capabilities. He used 24 ins. and 2,400 rpm. for cruising the engine throughout most of the flight, indicating between 110 and 120 mph.

Rather than strike out across the nation for his distance flight, Jagitsch made a double circuit of the state of Arkansas, his flight being observed by control towers at various cities. He landed back at Little Rock 12 hrs. and 26 minutes after take-off, with 15 gals. of fuel remaining in his tanks.

Named the "Arkansas Traveler" for the hop, the Apache consumed 93 gals. of fuel, averaging only 7.4 gals. per hour. Distance covered by the flight was 1,304 miles, with an average ground speed of 105 mph. The flight was monitored in detail in the offices of Arkansas Aviation Sales, with FAA control towers reporting check-point passovers so that Feltus and Woodard could maintain a running check on ground speed and headwinds for the purpose of giving the pilot assistance in plotting the flight. They also kept up with Weather Bureau observations and forecasts, relieving the pilot of this chore and feeding him advisories and headings when thunderstorms had to be detoured. Later, a map connecting up his check-points was used to total his distance traveled at 1,304 miles, but Feltus and Woodard say he actually flew about 1,400 miles including distance around thunderstorms.

No equipment malfunction was reported throughout the long engine-out flight, even though radio communications and navigation operations were continuous and even though electric fuel pumping was conducted for long hours in cross-feeding from the two right tanks to the left engine. Narco

Piper Tri-Pacer and Caribbean for 1960

Factory Data

	Tri-Pacer	Caribbean
Price	$9,340-$11,970	$8,795-$9,750
Horsepower	160	150
Gross Weight, lbs.	2,000	2,000
Empty Weight, lbs.	1,110	1,100
Useful Load, lbs.	890	900
Baggage Capacity, lbs.	100	100
Fuel Capacity, gals.	36	36
Optional Fuel Capacity, gals.	44	44
Top Speed, mph.	141	139
Cruising Speed—		
75% hp. @ 7,000 ft., mph.	134	132
With optional speed fairings, mph.	138	136
Stall Speed, with flaps, mph.	49	49
Rate of Climb, fpm.	800	725
Service Ceiling, ft.	16,500	15,000
Absolute Ceiling, ft.	19,000	17,500
Fuel Consumption, 75% hp., gph.	9	9
Cruising Range—		
36 gals., 75% hp. @ 7,000 ft., miles	536	528
44 gals., 75% hp. @ 7,000 ft., miles	655	645
Wing Span, ft.	29.3	29.3
Length, ft.	20.6	20.6
Height, ft.	8.33	8.33
Wing Area, sq. ft.	147.5	147.5
Wing Loading, lbs. sq. ft.	13.5	13.5
Power Loading, lbs. hp.	12.5	13.3

NOTE: All performance is for gross weight at sea level unless noted.

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2. Uses less gasoline and oil than the average family car.

3. Continuous-flow fuel injection engine gives the Bonanza easier starting, smoother operation and complete freedom from carburetor icing.

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5. Climbs 1,170 feet per minute. Service ceiling is 20,000 feet.

6. Clears 50-ft. obstacle in 940 feet, no wind. Lands in 1,130 feet over 50-ft. obstacle, no wind.

7. Exceptional visibility — and so quiet inside you can talk in normal tones during flight.

8. Rugged construction that permits the Bonanza to be licensed in a category requiring 15½% more strength than the category in which other single-engine business planes are licensed.

Why not make an appointment today to fly the new Bonanza? And while you're trying out the Bonanza, ask your Beechcraft distributor or dealer about low-cost Beech financing and leasing plans. Or write: Public Relations Dept., Beech Aircraft Corporation, Wichita 1, Kansas, U. S. A.

SUPER 18 TWIN-BONANZA BONANZA TRAVEL AIR MS 760 JET

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Mark 5 and Mark 2 radios and the Lear ADF-12E were used continuously, as was the rotating beacon.

Radio and television stations all over Arkansas kept the public informed of the flight, which drummed up a widespread interest. A crowd had gathered at the Little Rock airport when Jagitsch landed.

This proved to be a dramatic demonstration of the Piper Apache's safety and performance capabilities—not only because of the airplane's built-in excellence but because Jagitsch had practiced engine-out performance and had developed a technique for it. In other words, this was a carefully planned and conducted operation by people who knew what they were doing. It was also a demonstration of showmanship by a sales and service operator. Arkansas Aviation Sales is leading the entire Piper distributor network in the United States in percentage of quota sales—at the end of June, with 3 months yet to go in the sales year, this firm's aircraft sales were already 170% of its quota for the year. Feltus says he sold 56 airplanes in 1958, of which 40 were new aircraft. He has no dealers.

"Business is good but airplanes have to be sold—nobody is going to beat down our door buying airplanes," Feltus says. "This Apache flight proves we have good airplanes to sell—excellent machines which will deliver dependable, fast and comfortable transportation. But our job is to make a lot more people recognize and appreciate the mechanical perfection which is built into modern airplanes. They're all wonderful aircraft — all makes now in production are excellent. We staged this flight to dramatize our particular story before the public in our territory. We think it will convert a lot of people."—T.A.

OKLAHOMA AIR RESORT

(Continued from page 49)

by Piper Aircraft as one of nine Piper-approved vacation flight centers where instruction is available — it is offered here by Ross School of Aviation, which is headquartered at nearby Tulsa. Seaplane flight instruction is also conducted at the Lodge's dock, where H. N. (Major) Langley is the instructor for G. Nelson Maloscay of Miami, Okla. Some 50 doctors have indicated they will obtain water ratings while attending the Flying Physicians Association convention at the Lodge. Seaplane instruction is $20 per hour. Passenger hops are $3 for adults and $1.50 for children and are popular with guests.

Because they offer more places for people in airplanes to go, fly-in resorts are a factor in stimulating greater use of business and personal airplanes. As a business machine, the airplane is unique in that it has the advantage of offering relaxation and pleasure, which can be combined with business flying for greater aircraft utilization. The same safety, speed and comfort advantages of business flying enhance the airplane's values in seeking out and enjoying the best resorts, and places like Oklahoma's Western Hills Lodge make the airplane more useful than ever. —T.A.

WYOMING MECCA FOR AIRMEN

(Continued from page 33)

Millward, who formerly operated off the old "cow pasture" field now abandoned. Price has a Piper dealership under Art Whittaker and keeps four aircraft busy in scenic flights, charter work and instruction. His fleet includes a Comanche, a Tri-Pacer, a Cessna 172 and a 180.

Millward operates a Unicom station. The field boasts medium intensity lights, standard beacon, illuminated wind cone and segmented circle. A standard omni station is being installed at Blackrock, not too far distant, but the field needs an "H" facility or a terminal omni as navigational facilities are few and far between in those parts. Hangars are lacking but Winger said plans were underway to build some T's in the not too distant future.

Jackson is one of the smallest cities in the country boasting regular airline service. Frontier offers three flights a day on the route between Denver-Cheyenne and Idaho Falls. In the winter months only one flight a day is scheduled.

At this writing the main tourist and fishing season is ending. Big game hunting is about to begin. From what we saw of wild elk and moose in their native habitat we figure it's about as good a big game region as any in the U. S. After the big game season closes the ski fans flock into the area. Despite the very heavy and long snow season, roughly from December to May, the Jackson Airport is kept open by snow removal equipment.

So much has already been written about the beauty of the Grand Tetons and the Jackson Hole Country there's little reason to belabor the issue. Needless to say there's no more breathtaking scenery anywhere — even in Switzerland or the Lake Louise area of the Canadian Rockies. Yellowstone adjoins Grand Teton National Park on the north. Fishing in the lakes and streams is excellent and facilities of every description are top quality. There are very few resort areas in the world that can match this area for being practically perfect in so many different respects — cleanliness, moderate prices, excellent food, clean, comfortable hotel accommodations, climate, natural beauty, wildlife and above all, good and friendly folks who are just plumb glad to see you. As most people know, the Rockefeller family was largely responsible for saving this area for posterity, buying up the land over the years and deeding it over to the government. There is no doubt but that their influence for running an operation properly is still being felt all along the valley and it's too bad such few places are operated with the same high standards.

Now that the Jackson Hole Airport has been provided, the Teton country probably will become a mecca for airmen, whether for fishing or hunting or just for relaxation and vacationing in a natural wonderland.

—G.E.H.

Fly-in visitors at Jackson Hole Airport while we were there included Paul Fulks (left), Texas Aeronautics Commisssion chairman, and Vaughan Monroe (right) entertainment celebrity and pilot. Between them are Operator Price Millward and Airport Manager Richard Winger.

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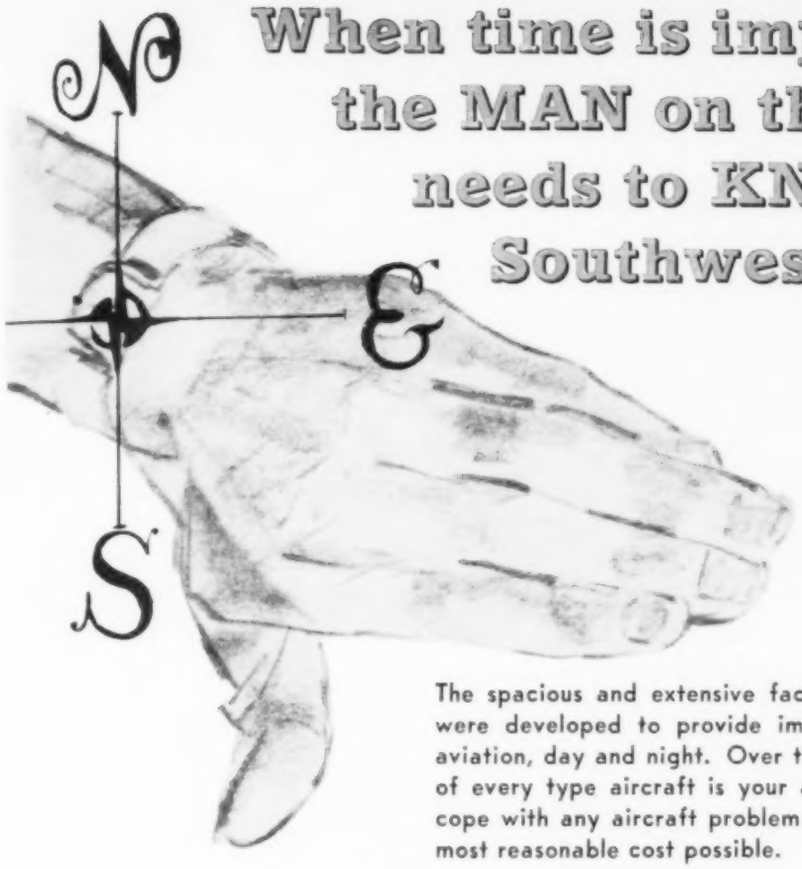

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Davenport—Elliott Flying, Inc.
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Kansas City, Kans.—Topeka Aircraft Sales & Serv.
Topeka—Topeka Aircraft Sales & Serv.
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KENTUCKY
Lexington—Blue Grass Airmotive, Inc.
Louisville—Blue Grass Airmotive, Inc.
Owensboro—Owensboro Aviation Co.

Continued

Continued From Preceeding Page

LOUISIANA
Baton Rouge—Baton Rouge Aircraft, Inc.
Shreveport—Currey Sanders Aircraft Co., Inc.
MASSACHUSETTS
East Boston—Atlantic Aviation Corp.
MICHIGAN
Grand Rapids—Grand Rapids Avia., Inc.
Iron Mountain—Fontana Avia., Inc.
Lansing—Francis Aviation
Pontiac—Flite Line, Inc.
Ypsilanti—Air-O-Fleet Corp.
MINNESOTA
Minneapolis—Flying Enterprise, Inc.
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MISSOURI
St. Louis—Young Aviation Corp
Valley Park—Midwest Aircraft Sales Corp.
MONTANA
Billings—Montana Aircraft Co.
NEBRASKA
Omaha—Lang Aircraft
NEW JERSEY
Linden—Linden Flight Service
Teterboro—Atlantic Aviation Corp.
NEW MEXICO
Albuquerque—Cutter-Carr Flying Service
NEW YORK
Mattydale—Syracuse Aircraft Sales, Inc.
New York (Teterboro, N. J.)—Atlantic Aviation Corporation
Rochester—Page Airways, Inc.
NORTH CAROLINA
Charlotte—Southern Airways Co.
Greensboro—Greensboro-High Point Air Service, Inc.
Winston-Salem—Piedmont Aviation, Inc.
OHIO
Cleveland—Donges Aircraft Sales, Inc.
Columbus—Columbus Aircraft Sales, Inc.
Dayton (Vandalia)—Ohio Aviation Co.
Findlay—Eddy Flying Service
Youngstown—Youngstown Airways, Inc.
OKLAHOMA
Muskogee—Sams Flying Service
Oklahoma City—Aircraftsmen, Inc.
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OREGON
Portland—Flightcraft, Inc.
PENNSYLVANIA
Erie—Derion Aviation
Pittsburgh (Dravosburg)—Bechett Aviation Corp.
Philadelphia—Atlantic Aviation Service, Inc.
Washington—Tri-State Aviation
SOUTH CAROLINA
Charleston—Hawthorne Flying Service
SOUTH DAKOTA
Rapid City—Snedigar Flying Service
TENNESSEE
Chattanooga—ExecAir, Inc.
Knoxville—Cherokee Avia., Inc.
Memphis—Jack Adams Aircraft Sales, Inc.
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TEXAS
Abilene—Abilene Aviation Co.
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Plainview—Claude Hutcherson
San Antonio—Alamo Aviation, Inc.
Tyler—Texas Aviation Corp.
UTAH
Salt Lake City—Utah-Idaho Aircraft Co.
VIRGINIA
Norfolk—Piedmont Aviation, Inc.
WASHINGTON
Seattle—Sulak Mfg. Co.
Spokane—Western Aircraft Corp.
WISCONSIN
Milwaukee—Butler Airplane Sales

LBS TEMPO II

(Continued from page 41)

structure have been proven in panel tests using a circular saw to inflict damage under pressure without crack propagation in the skin.

For fuselage dimensions, Brush and his engineers settled on a length of 60 ft. 1.5 inches, width of 5 ft. 2 ins. and height of 7 ft. This includes 9 ft. 4.5 inches more length and 1 ft. 3 ins. more cabin height than the standard B-26 fuselage, which was discarded. The greater size gives the Tempo II a pressurized interior 28 ft. long with headroom for passengers over 6 ft. tall.

Longer fuselage length gives the Tempo II more stability and better handling characteristics than those of the Twenty-six. The larger fuselage increases the frontal area from the Twenty-six's 27 sq. ft. to 31.2 sq. ft. but the new fuselage has a better fineness ratio, 9.4 as compared to 8.65, and cleaner lines which offset the larger fuselage's slight drag increase.

A benefit of much significance is the longer fuselage's effect of reducing VMC speeds about 13 mph., or about 10%, thus providing better engine-out capabilities.

A major accomplishment of the new fuselage is walk-through access between the cabin and cockpit of the mid-wing Tempo II. Ring spars designed and produced especially for L. B. Smith are of rolled aluminum alloy plate 1¼ inches thick. Providing wing attachment to the fuselage, they carry the spar structure through the fuselage with walk-through doorways. Construction is such that the wings are moved 10 inches farther out from the fuselage centerline than on the B-26, thus increasing wing span and wheel tread by 20 inches and propeller clearance by 10 inches on each side. Wing area is increased by 18 sq. ft. for more lift and slightly less wing loading.

Cabin and cockpit windows are from the DC-6, the cockpit having a ⅞-in. thick curved windshield. Overhead sky panels in the cockpit give added visibility for the pilot and copilot. An integral stair door is used for the cabin, which provides lavatory, galley, wardrobe and radio-electronics compartment between the cockpit and cabin. Custom executive interiors for the Tempo II will offer a variety of seating, providing for 7 to 10 passengers including berthable chairs and sofas, and a high-density interior layout will seat 13 passengers.

A long and large nose compartment accommodates radome and space for 1,000 lbs. of cargo and electronics equipment. This area was designed for ease of equipment installation and

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TA 18 BB Transmitters
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Please specify whether the equipment you are offering for sale is 14 or 28 volt. We are prepared to pay very best prices at all times—subject only to the condition and availability of the equipment.

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maintenance and incorporates many labor-saving features.

Wing-tip fuel tanks and main tanks offer 1,170-gal. standard fuel capacity, while optional outer panel tanks add 200 gals. of fuel for a total of 1,370 gals. of fuel capacity. Cruising range with full tanks and 45-minute reserve is 2,200 miles.

The realities of 350-mph. cruising speed, as featured by the Tempo II, are far-reaching. An 800-mile trip, for example, is reduced to a mere 2 hrs. 16 mins., a 1,200-mile trip to 3:25, a 1,600-mile trip to 4:45 and a 2,200-mile trip to less than 7 hrs. — all nonstop and in pressurized comfort.

This far exceeds DC-7C and all piston-engine aircraft cruise speed for travel and can only be matched by turbine or jet travel at much higher costs than those of the economical Tempo II. A turbine airplane capable of more than 350-mph. cruising speed will cost about 3 times the sales price of the Tempo II and turbine engine and propeller costs are many times those of the plentiful and bargain-priced R-2800 engines of the Tempo II. These 2,100-hp. engines are authorized for more than 1,400 hours of operation between overhauls.

A corporation which operates 100,000 airplane miles of transportation annually will fly the Tempo II less than 290 hours to cover that distance, as compared to more than 500 hours of flying necessary to cover 100,000 miles in a 200-mph. airplane. This effect of high speed clearly illustrates the stretchout involved in engine overhauls for the R-2800's.

Because its new fuselage provides space enough for installations of complete airline-type radio and electronics systems and its power is sufficient to carry a large enough payload to include complete equipment, Tempo II owners can keep pace with future equipment developments to meet air traffic control requirements. This equipment is growing in complexity, emphasizing the critical need for airframe designing to meet its demands. It has already outgrown the small dimensions of equipment bays available in some corporate aircraft not designed for modern and future equipment. Tempo II not only provides for this factor but was designed so that equipment installations can be simplified and will be readily accessible for ease of installation and servicing. A complete and extensive lineup of optional equipment will be offered as a distinctive feature of the airplane, including the most advanced and sophisticated radar, radio, electronic and instrument systems available.

Optional equipment other than radar, radio, autopilot and electronics systems include reversible propellers, standby rocket thrust units, drag chutes, de-icer boots and other equipment. Tempo II's empty weight of 23,000 lbs. is without interior and electronics. Its 35,000-lb. gross weight provides a 12,000-lb useful load. of which full tanks would use 7,000-7,600 lbs. for standard and optional fuel capacity, leaving more than 4,000 lbs. for electronics, interior, people and baggage. Custom interior designs by Charles Butler Associates of New York and installations by L. B. Smith's large custom shops are available.

NEW CESSNA 210

(Continued from page 32)

seats.

The fuel-injection Continental engine will no doubt be a big sales point on the 210. While it takes a little dual instruction to use it properly, it will be difficult for the pilot to go back to old carburetor type engines once he's on to selecting power and mixture settings so accurately with metered fuel, as any 310-C owner will tell you.

The engine is equipped with a constant-speed propeller and engine cooling is controlled by adjustable cowl flaps.

The 210 interior is plush and comfortable and our only reservation was the width and leg room of the back seat, although we flew only in the left front seat. Front seats are adjustable both fore and aft and can be tilted into three positions as can the rear seat. De luxe fabrics and the generous use of foam rubber and leather were noticeable. Head rests are optional for the front and rear seats and arm rests for all four passengers are standard. Eight exterior color combinations are available with two basic combinations for the interior.

Standard electrical equipment on the airplane includes 35-amp generator, navigation light flasher, 33-amp battery, auxiliary fuel pump, landing gear indicator lights, landing lights, instrument lights, switches and circuit breakers for all electrical circuits.

While the present FAA certification is for 55 gallons of fuel, the second engineering prototype which we flew held 65 gallons. No doubt auxiliary fuel above the standard 55 gallons will be provided for as optional.

On take-off we used about 15 degrees of the hydraulic "Para-Lift" flaps and remained under 300 feet until clearing the military air base just south of the Cessna factory field at Wichita.

We took a power reading at 6,500 feet, 2,300 rpm. and 23 inches manifold pressure. Our computer showed us using 65 percent power and 12.5 gallons of gas per hour, indicating 165 mph., which trued out at 189 mph. At 9,000 feet, pulling 21 inches at 2,300 rpm., outside temperature of 58 degrees F., six pounds PSI, we burned only 11 gallons per hour at 57.5 per cent of power, indicating 160 mph.

NEW PIPER DISTRIBUTOR FOR HOUSTON is Cummings and Grove Aviation, Hangar 8, Houston International Airport. Manufacturer W. T. Piper is pictured at center discussing new distributorship details with (left to right) J. W. Miller, Piper general sales manager; Joel Cummings, president of Cummings and Grove; Jack Groves, vice president of the new outlet, and H. R. Nevitt, sales manager of Cummings and Grove.

and trueing out at a good 190 mph.

Put the 210 in a bank and she'll stay there forever. It's practically impossible to power stall the airplane. Few airplanes have ever been built that can match such stability on every axis. That's why we believe the 210 will require very little transition for pilots flying the lower-performance airplanes with fixed gear despite increased power and performance, retractable gear, vernier type throttle, propeller and mixture controls, cowl flaps and the fuel injection engines, all of which will call for familiarization.

What effect will the 210 have on the market? According to Cessna's top sales executive, Frank Martin, the airplane primarily expands the market in Cessna's own family. It might temporarily cause a levelling off in 182 sales because of absorption of present dealer and distributor sales energy. He pointed out that the fast selling Piper Comanche didn't affect Cessna sales and the 210 by the same token should not affect Cessna's "mighty middle line in 1960. ★ ★ ★

JUST AMONG OURSELVES

(Continued from page 17)

trates every segment of civil aviation.

We admit there are no pat answers to the problem. What we do suggest is a concerted effort within the FAA to launch a real staff study on the subject, utilizing the tremendous amount of experience of its own career men and the many agencies within the aviation industry who are vitally concerned with the problem and its implications. These include foundations, trade associations, insurance companies and consumer groups. In other words we have the facts, the figures and the experience. What we need is the leadership or catalytic agent to put all the ingredients together and come up with a practical formula for making the personal utility airplane realize its true potential — the safest means of personal transportation available.

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A NEW HIGH IN HIGH EFFICIENCY

New Cessna 310C climbs faster on one engine than any other light twin

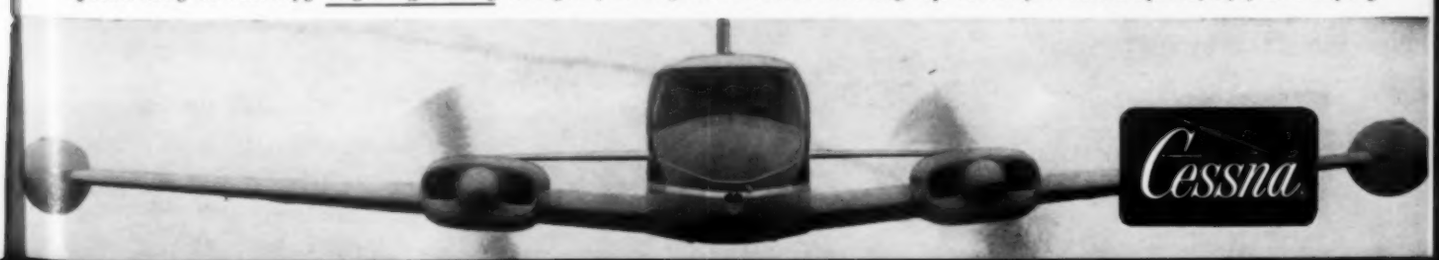
Now in 1959, the new *High-Efficiency* 310C once again proves its superiority over any other light twin in a crucial test of power and safety. It climbs on *one* engine at 440 feet per minute—*with five passengers!*

Because of its *High-Efficiency* design, this fast new business twin packs more power than any other. Two *High-Efficiency* fuel-injection Continental engines deliver a total of 520 h.p. . . . boost speeds up to 242 m.p.h. . . . and lift service ceiling to an above-the-weather 21,300 feet. Continuous-flow fuel injection system eliminates the carburetor and possibility of carburetor icing . . . assures even fuel distribution which maximizes power and smooths engine performance.

High-Efficiency appears prominently in the newly designed interior, too. You get *five* choices of seating arrangements . . . in a cabin so spacious you can relax in a fully reclining lounge! And within the luxurious cabin, you can work, talk, or nap in club-room quiet. A remarkable new muffling system in new, longer engine nacelles mutes engine sounds to a low hum.

Be sure to try all the *High-Efficiency* features of the new Cessna 310C. Price: $59,950 f.a.f. Wichita. Call your Cessna dealer now (Yellow Pages of phone book). Look at all *seven* great Cessna models. Also ask your Cessna dealer about lease plans. Or write: Cessna Aircraft Company, Dept. FM-12, Wichita, Kan.

Quick way to identify High-Efficiency design: flat engine nacelles and big tip tanks for extra speed, lift, and safety



Cessna

New Business in the Hangar

12th Annual NBAA Meeting at Minneapolis Oct. 6-8 to Feature Turbine Aircraft Forum

A CLOSE look at the operational use of turbine and jet business aircraft will feature forum discussions during the National Business Aircraft Association's 12th annual meeting in Minneapolis, October 6-8 at the Leamington Hotel and Wold-Chamberlain Airport. Trade displays at the hotel will take up over 80 booths and over 30 aircraft manufacturers and conversion centers have been invited to display their aircraft in static and flight exhibits at the airport.

Awards at the meeting will include the NBAA's meritorious award for distinguished service to aeronautics, which will go to James H. Doolittle for his four decades of service, and the Women's Aeronautical Association of Kansas award to Arthur E. Abney, Illinois aeronautics director, for his contributions to business flying.

Following is the meeting's tentative program as released by William K. Lawton, executive director:

TUESDAY, Oct. 6 — Exhibits open 9 to 6. 10-11:30 a. m., annual reports, election of two board members, report on insurance program. Noon, NBAA board executive session; no luncheon. 1:30-5 p. m., turbine-jet business aircraft forum, with representatives of Canadair, PacAero, Grumman, Fairchild, Lockheed, McDonnell and Beech invited to participate. 5:30-6:45 p. m., social hour, exhibit hall. 7 p. m., banquet with Women's Aeronautical Association of Kansas award to Arthur E. Abney, presentation of Miss Business Aviation, announcement of 1960 NBAA president, and address, "It's What's Up Front That Counts," by Maj. Gen. Joseph D. C. Caldera, USAF deputy inspector general for safety.

WEDNESDAY, Oct. 7 — Exhibits open all day. 9:30-10:30 a. m., FAA research and development programs and their future effects on business aircraft operations, by Col. Carl B. Fisher, USAF, chief, plans and programs division, FAA Bureau of Research and Development. 10:40-11:40 a. m., electronics future for the modern business aircraft, with Joseph H. Tippets, FAA Bureau of Facilities director, invited to speak. 12:15-1:30 p. m., luncheon with company and pilot safety awards by Henry W. Boggess. 1:45-2:45 p. m., the business aircraft operations branch of the FAA, with George S. Buchanan, chief, Business Aircraft Operations Branch, and Emil Jacobson, chief, Business/-Corporate Operations Section. 3:15-4:15 p. m., aircraft performance characteristics and operating techniques for DC-3 and light twins, with John Paul Jones, chief of flight test, FAA, Oklahoma City Training Center. 5:30-6:30 p. m., social hour, exhibit hall. 7 p. m., annual awards night, with presentations to William B. Belden, first NBAA president, and Lt. Gen. James H. Doolittle.

THURSDAY, Oct. 8 — Exhibits open all day. 9:30-10:30 a. m., schedule and dispatch procedures for business aircraft, with E. Tilson Peabody of General Motors, Don Richardson of Minnesota Mining, and O. B. Wynn of Ray-O-Vac. 10:45-11:15 a. m., your voice in air route traffic control, with H. S. Chandler of FAA. 11:15-11:45 a. m., your voice in air space matters, with Charles W. Carmody of FAA. 11:55-12:45, busses leave for airport. 12:15 noon, buffet luncheon at Minnesota Airmotive hangar. 2 p. m., American business on the wing, static and flight demonstrations with over 200 aircraft on display. 4:40-5:30 p. m., busses return to hotel. 6:30-midnight, Paul Bunyan fun night at hotel ending 12th annual meeting.

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EASING OF AIRCRAFT ALTERATION PROCEDURES, particularly those relating to STC (supplemental type certificate) work, is proposed by FAA in changes which would affect CAR Parts 1, 3, 4b, 5, 6, 7, 13, 14, 18, 24, 43 and 52. Oct. 1 is deadline for comment. Under the proposal, the individual making an alteration to an aircraft would have option of obtaining FAA approval or of simply reporting the alteration and taking responsibility for compliance with CAR. The proposal would delete definitions of "major" and "minor" alterations and re-define "alteration." It would prohibit operation of an altered aircraft if alteration does not comply with Part 18.

ADDISON AIRPORT, privately-owned non-airline business flying center at Dallas, recorded an 18% increase in operations during the first half of 1959, averaging 7,800 landings and take-offs monthly for a January-June total of 46,800 operations as compared to 39,600 operations for the last half of 1958, which averaged 6,600 monthly operations. The airport bases 153 airplanes, up 17%, and 12 companies based on the field employ 253 persons with payrolls totaling $1,330,000 annually. These firms are Collins Radio, Riteway Airmotive, D & S Aviation, Dal-Tex Aviation, Brown Aero Corp., Delhi-Taylor Oil, J. R. Gray Co., Nor-Tex Aviation, Airport Restaurant, Airpark, Inc., Texas Instruments and Addison's own staff. The business flying center represents airport investments totaling $4,000,000. It features complete, 24-hour, all-weather facilities.

REMMERT-WERNER, Lambert Field, St. Louis, delivered six new corporate transports last month, four of them DC-3's, one a Martin 404 and the sixth a Convair 340-440. . . . Kewanee Oil took delivery of a deluxe executive Martin 404, Skip Wittner and Bob Quelch, pilots. They have Sperry SP20 autopilot, Bendix RDR-1D radar, dual Collins omni with dual Collins 51V glideslopes and dual RMI's, Bendix MN53 3-light marker receiver, Collins 17LR-51R and ARC-210 VHF communications, Collins 18S4, dual ARC-21 ADF's and many other features. . . . Gus Rahm and John Downey are pilots for Schenley Industries' new deluxe executive Convair 340-440 from R-W, with custom interior, Sperry SP20 autopilot, Bendix RDR-1D radar, dual Collins 51R3 omni with dual Collins 51V glideslopes and RMI's, dual Bendix ADF, Bendix MN53 3-light marker, Collins 17L4-51R3 and 17L6-51X VHF communications and auxiliary power unit. . . . Tom Roche, chief pilot, Deere & Co., took delivery of a new deluxe executive DC-3 equipped with Collins WP-101 radar, AP-101 autopilot, with FD-104 integrated flight system and MC-102 compass, dual Collins 51X-2 omnis with dual 51V3 glideslopes, Collins 51Z3 3-light marker, ARC-210 VHF transceiver, ARC-21A ADF, lightweight landing gear doors, short exhaust stacks, aileron gap strips, Sierracote windshields, special radio compartment with observation windows and custom interior with large picture windows. . . . Steuart Investment Co., Dewey Peterson, chief pilot, took delivery of a new executive DC-3 with dual Collins omni, ARC-210 VHF, lightweight landing gear doors, dual hydraulic system, long-range outer-panel tanks and other features. . . . Freeman Fleming, chief pilot, Irving Oil Transport, Saint John, New Brunswick, took delivery of a new Super-92 DC-3 with accommodations for 14 passengers, work tables, adjustable desks, electric facilities for office machines, galley, lavatory, picture windows, dual Collins omni with dual glideslopes, Collins 17L-51R VHF transceiver and standby transceiver, dual Bendix ADF's, isolation amplifiers with dual cockpit speakers and special radio and instrument panels. . . . Campbell Soup, Charles Nelms, chief pilot, took delivery of a new executive DC-3 with lightweight landing gear doors, aileron gap strips, picture windows, custom panels, RCA AVQ-10 radar, Sperry A12 autopilot with C4 Gyrosyn compass and H5 electric horizon, dual Collins 17L6-51R3 VHF communications, dual Col-

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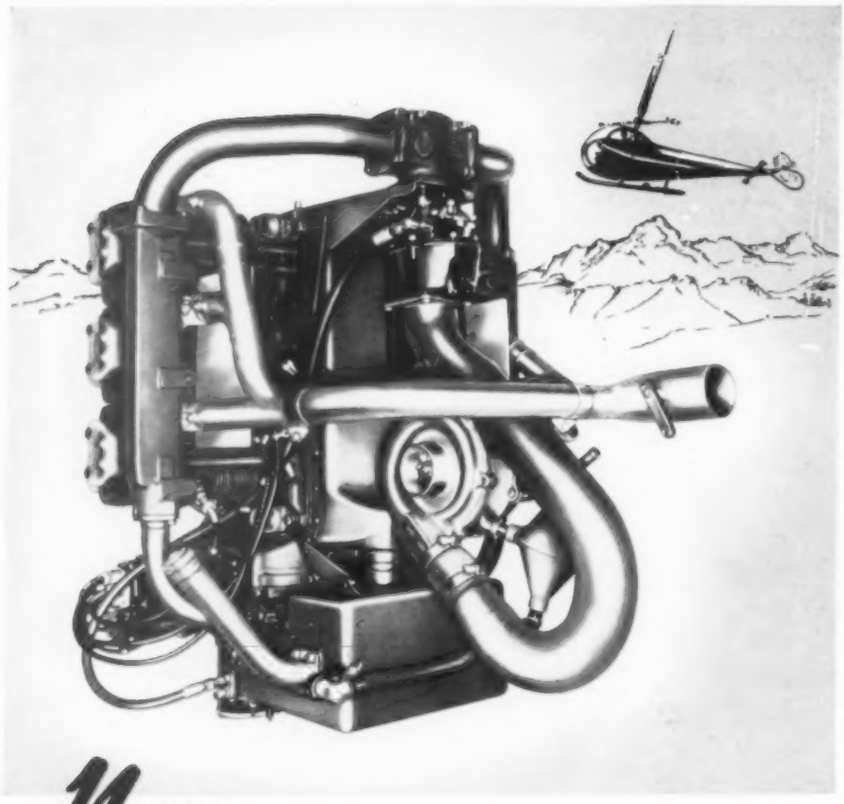

New Turbosupercharged Franklin

MAINTAINS 225 HP to 10,000 FT.

Weighs only 40 lbs. more than naturally aspirated 200 and 210 hp engines

This new turbocharged engine provides the solution to the problem of high altitude performance for light helicopters.

The engine's sea level rating is 225 hp and it will maintain full 225 hp output to 10,000 ft. altitude. It is the first and only turbocharged engine in its horsepower range.

Weight of this new Franklin 6VS-335 turbocharged engine is only 40 lbs. more than the familiar Franklin 200 and 210 hp naturally aspirated engines which power so many Bell and Hiller 'copters.

Write on your company letterhead for detailed specifications.

FAA TYPE CERTIFICATE NO. 1E2

This engine without the turbo is FAA approved for use as an 80 octane, 200 hp engine. If such an application is of interest to you, write for details.

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lins 51R3 omni with dual 51V glideslopes and RMI's, dual Bendix omni mag, dual ARC-21 ADF's. HF transceiver, Collins 51Z 3-light marker and other equipment. . . . Floyd Graham brought in his Carrier Corp. DC-3 for new de-icer boots, complete repaint and control surface recovering.

DALLAS AERO SERVICE, Love Field, Dallas, had Dick Wearth's A. R. Dillard de Havilland Heron in for complete U. S. licensing, paint, interior, radio and L2 autopilot installation. . . . Double engine change was performed for Kermit Woods' Rugene Transport DC-3. . . . A Swiflite Corp. Lodestar received tank seal, engine change and partial paint. . . . The David Douglas de Havilland Dove from Manitowac, Wis., Chuck Higgins, pilot, was in for miscellaneous work and 100-hr. . . . Hoover Ball and Bearing's Dove received 1,000-hr. inspection, 50-amp. generator systems and other work. . . . Ralph Cobb brought in the C. G. Glasscock Dove for double engine change, 8,800-lb. gross weight modification and miscellaneous work. . . . 1,000-hr. inspections were performed for Dick Powell's BJ Service Aero Commander and Carl Hastings' Central Oil Aero Commander.

O. B. CALLAN, veteran of many years of aviation sales and one time Beech Aircraft sales manager, has been named factory sales representative of L. B. Smith Aircraft by Carl Wootten, vice president, and will base in Dallas to cover eight southwestern states in sales of the new 350-mph. pressurized Tempo II corporate transport, developed from the B-26.

Callan

EXECUTIVE AIRCRAFT, Redbird Airport, Dallas, received Paul Rider's Halliburton Oil Well Cementing DC-3 for new paint job, control surface recovering, heater overhaul, and overhaul of landing gear and hydraulic systems. . . . Charles Baudoux's S. B. Burnett Estate Lodestar was in for prop overhaul, engine change and periodic inspection. . . . Ken Hunter brought Kerr-McGee's DC-3 in for miscellaneous repairs. . . . Steve Germick's Texaco DC-3 from Houston was in for new fuel tanks and other work.

GARRETT CORP.'s AIRESEARCH AVIATION SERVICE DIVISION, Los Angeles International Airport, has in its hangar Charles Zimmermann's new Continental Oil Grumman Gulfstream for executive interior, Sperry SP20 autopilot, Bendix RDR-1B radar, complete radio and electrical installation and paint job. . . . Another brand-new executive turbine

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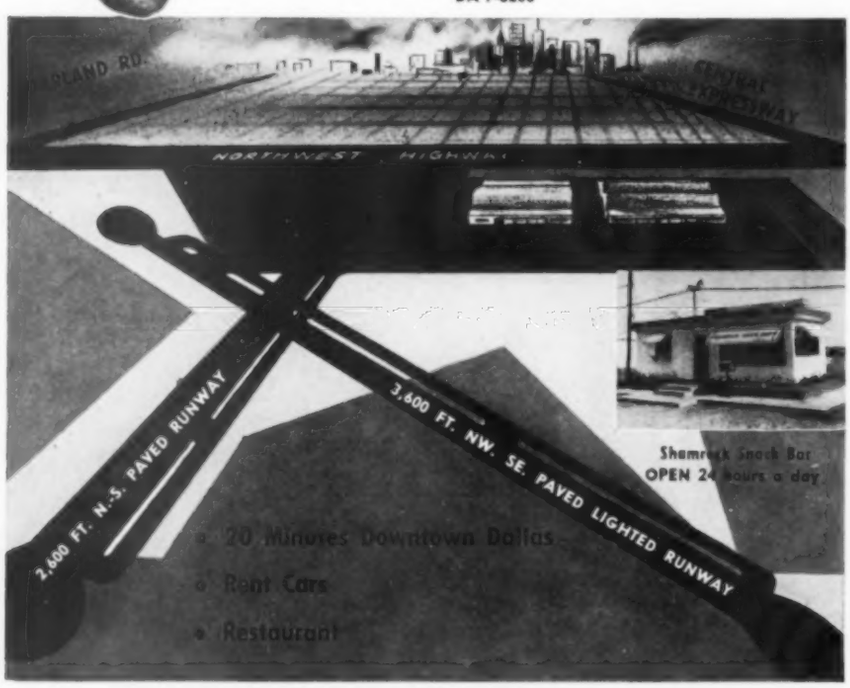
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transport in the hangar is Charles Maynard's Union Carbide Fairchild F-27, receiving an interior. . . . AiResearch's wood shop now has an electrical-pneumatic press for fabricating interior bulkheads, table tops and cabinet tops from lightweight honeycomb materials, a square foot of which weighs only 5 ounces as against 22 ounces for the same size of balsa cored sandwich material.

NEW DALLAS AVIATION TRADES ASSOCIATION has elected Henry Stuart, Addison Airport vice president and general manager, as president; Bert Corry, Airport Flying School, as vice president, and M. T. Goble, Goble Aviation, as secretary-treasurer. Thirteen aviation firms organized DATA to promote Dallas area activities and shops, to develop high standards of service operations and to promote national recognition.

AIR REPORT

(Continued from page 5)

is scheduled with Canadair making the airframes and Orenda Engines Division of A. V. Roe making the engines under licensing arrangements with Lockheed and General Electric.

PAN-AMERICAN WORLD AIRWAYS HAS ORDERED 12 SPECIAL LONG-RANGE LOCKHEED MODEL 207 PROPJET AIR FREIGHTERS costing $60,000,000 for 1962 delivery. Model 207 grosses 115 tons, is powered by four 6,500-hp. Allison propjets and can carry 35-ton payloads across the Atlantic at 360 mph. . . . **SLICK AIRWAYS** has purchased three Lockheed 1049H Super Constellations costing $7,000,000 as first step in re-establishing its domestic cargo services. . . . **PACIFIC SOUTHWEST AIRLINES**, intrastate carrier operating between San Diego, Los Angeles and San Francisco, has ordered its fourth Lockheed Electra propjet.

FIRST LOCAL SERVICE AIRLINE RE-ORDER OF FAIRCHILD F-27 has been received by Fairchild from Bonanza Air Lines, which purchased four additional F-27A Friendships after placing three F-27's in

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service. . . . **OZARK AIR LINES** has received its third F-27 from Fairchild, becoming 12th airline to operate the Friendship.

SCHWEIZER AIRCRAFT OF ELMIRA, N. Y., has delivered its 100th 1-26 sailplane, which has been produced in the largest quantity for any single type of sailplane since the war. It went to Antelope Valley Soaring Club, Inc., Adelanto, California. Over 100 soaring clubs are active in the U. S. . . . **WOLF HIRTH,** world-famed designer and builder of sailplanes, was killed in July in Germany in a crash. One of the great pioneers in soaring and sport flying, his designs included the famous Minimoa.

WHAT FAA IS DOING TO WHOM: Deadline for comments on proposed maximum age limits for airline pilots has been extended 30 days to Sept. 28; airline pilots would be retired at 60 and command of jet-powered transports would be limited to pilots type-rated prior to 55th birthday or effective date of regulation. . . . ATC rules have been amended to eliminate some of the delay pilots encounter in obtaining landing clearances on final approach and to remove potential cause of taxiing collisions. "Approach end of runway" replaces vague "airport boundary" as reference point for separation and controller is authorized to issue landing clearance before preceding aircraft has actually cleared the runway if sufficient separation exists. Phraseology has been changed to eliminate word "position" and to use words "hold, hold short of, hold on or hold for traffic" when controller desires that an aircraft not move. . . . FAA has proposed to amend regulations so that a student pilot shall not pilot an aircraft other than that of the category, class and make and model which has been endorsed on his student pilot certificate by a flight instructor. . . . Another FAA proposal will require airborne weather radar on all air carrier passenger-carrying aircraft.

Airmen's Calendar

Sept. 19-20—National Championship Midget Air Races and 10-Act Air Show by Cole Brothers, Baer Field, Ft. Wayne, Indiana.

Sept. 23-24—Airwork Corp. Engine and Operations Symposium, Millville, N. J.

Sept. 30-Oct. 3—23rd Annual International Northwest Aviation Council Convention, Multnomah Hotel, Portland, Ore.

Sept. 30-Oct. 2—13th Annual Meeting, Southeast Airport Managers Association, Washington-Drake Hotel, Durham, N. C.

Oct. 6—12th Annual New York State Airport Conference, Hotel Onondaga, Syracuse.

Oct. 6-8—12th Annual National Business Aircraft Association Meeting, Hotel Leamington, Minneapolis.

Oct. 6-8—1959 National Airport Conference, University of Oklahoma, Norman, Okla.

Oct. 7-10—4th National Meeting, Air Traffic Control Association, Biltmore Hotel, Oklahoma City.

Oct. 12-14—National Association of State Aviation Officials Convention, Mark Hopkins Hotel, San Francisco.

Oct. 17-19—Florida Aero Club Weekend Flight to Nassau. Contact Harry B. Collins, Air Cruise Director, 375 NE 154th St., North Miami Beach 62, Fla.

Oct. 25-28—Flying Lawyers Legal Eagles Organization Fly-In and Symposium, Sullivan County Airport, Monticello, N. Y. For details, contact Albert Rothblott, P. O. Box 289, Camden, N. J.

Nov. 16-17—NAA Annual Meeting, New York City.

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LODESTAR MODIFICATIONS

(Continued from page 44)

nas, pitot mast, dump chutes, bad skin patches, etc.

7. *200,000-BTU Janitrol Heater; costs $6,650.* Installation goes in either No. 1 or No. 2 baggage compartment.

8. *Goodyear Single Disc Spot Brakes; adds 34 lbs.; costs $3,995.* Helps improve accelerate-stop distance.

9. *Rudder Spring Tabs; adds 72 lbs.; no speed change claimed; costs $6,495.* Provides better engine-out directional control and makes possible use of 1,350 hp. for take-off.

10. *Engine Accessory Cowling and Cowl Flaps; adds 5-10 mph. and 60 lbs. of weight. Costs $5,500-$8,900 depending on existing systems.* Consists of incorporating controllable cowl flaps, opening inward; redesigning accessory cowling to fair with power section, and redesigning carburetor heat system to eliminate heat muffs while providing sufficient carburetor heat. For 1,350-hp. Wright R-1820's, this provides positive control over cylinder head temperature for more efficient engine operation; gives more carburetor heat with 119-degree rise; reduces drag because cowl doors open inward, and improves both engine and airplane performance.

If all ten kits are added, the claims total 30 to 37 mph. in additional speed and 256 lbs. in additional weight.

Marked over-all performance improvements have been praised by pilots, exceeding manual performance for the Lodestar without modifications. Cruising speed, for example, has gone up to 250-255 mph. at 10,000 ft. using 690 hp. per engine. Dallas Aero Engineer Walt Clark reports that a Lodestar with the kits, including the new engine cowling but not including the radar nose, demonstrated a 60-ft. rate of climb at 16,000 ft. with one engine feathered and the other engine pulling 850 hp. and with the airplane at 19,000-lb. gross weight. This was observed and record-

Wheel well doors, closed with gear in up and down position, and strut door, open here, are shown in this photo of Dallas Aero modification. Fairing is removed from strut.

Two 170-hp. Riley Twins

Both radio equipped. Engines have 400 hrs. since major.

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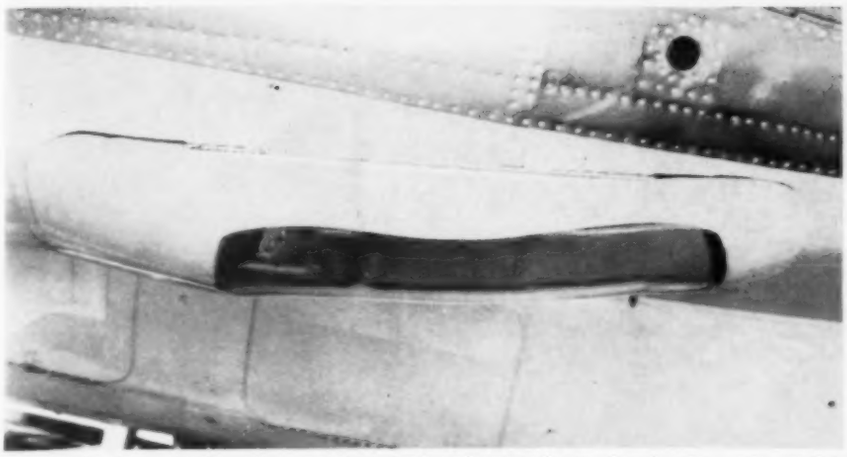

Side view shows Dallas Aero nacelle wheel well with doors closed. Above the well is heater exhaust outlet. Baggage doors are in background.

ed during FAA flight test work while obtaining approval for the new cowling.

This new cowling enables the pilot to precisely control engine temperatures, which now average 180 degrees C. for all configurations except climb, in which the reading is about 200 degrees. With the unmodified cowling, which did not offer temperature control, the engines ran over a wide range and down as low as 100 degrees. These low temperatures warp valves and shorten engine life. Carburetor heat rise of 119 degrees with the new cowling meets CAR 4b requirements and does away with the need for alcohol anti-icing — the unmodified cowling's carburetor heat rise was only 50 degrees.

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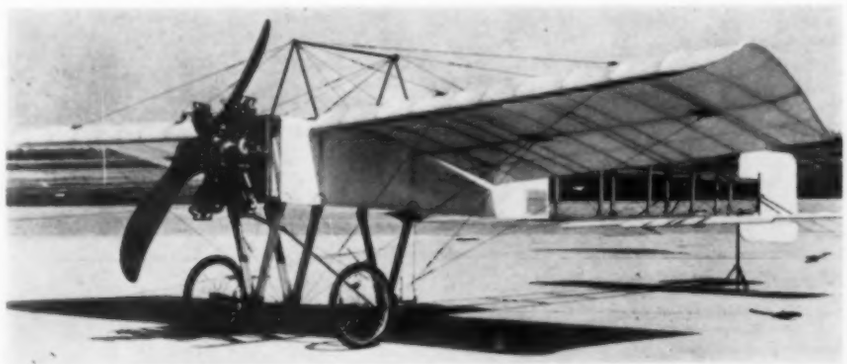

REPLICA OF CLYDE CESSNA'S 1911 MONOPLANE was built by Oldtime Airman Burrell Tibbs, still instructing pilots at Oklahoma City, and displayed by Cessna Aircraft recently. Named "Silver Wings," it had 6-cylinder 50-60-hp. Anzani radial engine, topped 50 mph.

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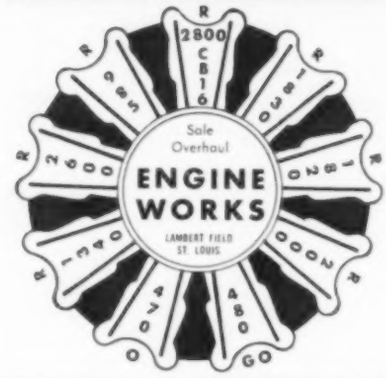

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